# SEQUENCE LISTING

<110> Dattwyler, Raymond J.
Seinost, Gerald
Dykhuizen, Danial
Luft, Benjamin J.
Maria J.C. Gomes-Solecki



24

27

26

<120> Groups of Borrelia burgdorferi and Borrelia afzelii That Cause Lyme Disease in Humans

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<150> US 60/140,042

<151> 1999-06-18

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E. X

3

573

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gta Val	ttg Leu	aaa Lys	aat Asn 100	gaa Glu	gaa Glu	tta Leu	aag Lys	gaa Glu 105	aag Lys	att Ile	gat Asp	aca Thr	gct Ala 110	aag Lys	caa Gln	336
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ggt Gly	ctg Leu 130	gac Asp	aat Asn	ctt Leu	act Thr	gat Asp 135	gat Asp	aat Asn	gca Ala	caa Gln	aga Arg 140	gct Ala	att Ile	tta Leu	aaa Lys	432
aaa Lys 145	cat His	gca Ala	aat Asn	aaa Lys	gat Asp 150	aag Lys	ggt Gly	gct Ala	gca Ala	gaa Glu 155	ctt Leu	gaa Glu	aag Lys	tta Leu	ttt Phe 160	480
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1			Ser	5				) Asn	10					10	Lys	
Ile	Thr	Glu 35	20 Ser	Asr	n Ala	. Val	Val	25 . Leu	ı Ala	val	Lys	Glu 45		Glu	Thr	
	50	ı Ala				55	Lev				60				Lys	
65	e Gly				70					75					Leu 80	
Leu	ı Ser	Gly	/ Ala	85	c Ala	ı Ile	Sei	Asp	Leu 90	ı Ile	e Ala	a Glu	ı Lys	95	ı Asn	

Ch.X

Val Leu Lys Asn Glu Glu Leu Lys Glu Lys Ile Asp Thr Ala Lys Gln 105 100 Cys Ser Thr Glu Phe Thr Asn Lys Leu Lys Ser Glu His Ala Val Leu 120 Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Gln Arg Ala Ile Leu Lys 135 Lys His Ala Asn Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe 150 Lys Ala Val Glu Asn Leu Ser Lys Ala Ala Gln Asp Thr Leu Lys Asn 170 165 Ala Val Lys Glu Leu Thr Ser Pro Ile <210> 9 <211> 579 <212> DNA <213> Borrelia burgdorferi <220> <221> CDS <222> (1)...(579) <400> 9 atg act tta ttt tta ttt ata tct tgt aat aat tca ggg aaa gat ggg Met Thr Leu Phe Leu Phe Ile Ser Cys Asn Asn Ser Gly Lys Asp Gly aat aca tot gca aat tot gct gat gag tot gtt aaa ggg cot aat ott 96 Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu 20 aca gaa ata agt aaa aaa att acg gat tct aat gcg gtt tta ctt gct 144 Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu Leu Ala gtg aaa gag gtt gaa gcg ttg ctg tca tct ata gat gaa att gct gct 192 Val Lys Glu Val Glu Āla Leu Leu Ser Ser Ile Asp Glu Ile Āla Āla aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat acc gaa 240 Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp Thr Glu aat aat cac aat gga tca ttg tta gcg gga gct tat gca ata tca acc 288 Asn Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr cta ata aaa caa aaa tta gat gga ttg aaa aat gaa gga tta aag gaa 336 Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu Lys Glu 105 aaa att gat gcg gct aag aaa tgt tct gaa aca ttt act aat aaa tta 384 Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn Lys Leu aaa gaa aaa cac aca gat ctt ggt aaa gaa ggt gtt act gat gct gat 432 Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp Ala Asp

135

140

gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa ggt gct 480 Āla Lys Glu Āla Ile Leu Lys Thr Asn Gly Thr Lys Thr Lys Gly Āla 150 gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca aaa gca 528 Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser Lys Ala 165 gct aaa gag atg ctt gct aat tca gtt aaa gag ctt aca agc cct gtt 576 Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val 185 579 gtg Val <210> 10 <211> 193 <212> PRT <213> Borrelia burgdorferi <400> 10 Met Thr Leu Phe Leu Phe Ile Ser Cys Asn Asn Ser Gly Lys Asp Gly 10 Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu 25 Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu Leu Ala 40 Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala 55 Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp Thr Glu 75 70 Asn Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr 90 85 Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu Lys Glu 105 100 Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn Lys Leu 120 115 Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp Ala Asp 135 Ala Lys Glu Ala Ile Leu Lys Thr Asn Gly Thr Lys Thr Lys Gly Ala 155 150 Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser Lys Ala 175 170 165 Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val 185 Val <210> 11 <211> 582 <212> DNA <213> Borrelia brgdorferi <220> <221> CDS

Al x

# 51 <del>7/10</del>2

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aat Asn	aca Thr	tct Ser	gca Ala 20	aat Asn	tct Ser	gct Ala	gat Asp	gag Glu 25	tct Ser	gtt Val	aaa Lys	Gly aaa	cct Pro 30	aat Asn	ctt Leu	96
aca Thr	gaa Glu	ata Ile 35	agt Ser	aaa Lys	aaa Lys	att Ile	acg Thr 40	gat Asp	tct Ser	aat Asn	gcg Ala	gtt Val 45	tta Leu	ctt Leu	gct Ala	144
gtg Val	aaa Lys 50	gag Glu	gtt Val	gaa Glu	gcg Ala	ttg Leu 55	ctg Leu	tca Ser	tct Ser	TIE	gat Asp 60	gag Glu	ctt Leu	gct Ala	aaa Lys	192
gct Ala 65	att Ile	ggt Gly	aaa Lys	aaa Lys	ata Ile 70	aaa Lys	aac Asn	gat Asp	ggt Gly	agt Ser 75	tta Leu	gat Asp	aat Asn	gaa Glu	gca Ala 80	240
aat Asn	cgc Arg	aac Asn	gag Glu	tca Ser 85	ttg Leu	tta Leu	gca Ala	gga Gly	gct Ala 90	tat Tyr	aca Thr	ata Ile	tca Ser	acc Thr 95	tta Leu	288
ata Ile	aca Thr	caa Gln	aaa Lys 100	tta Leu	agt Ser	aaa Lys	tta Leu	aac Asn 105	gga Gly	tca Ser	gaa Glu	ggt Gly	tta Leu 110	aag Lys	gaa Glu	336
aag Lys	att Ile	gcc Ala 115	Ala	gct Ala	aag Lys	aaa Lys	tgc Cys 120	Ser	gaa Glu	gag Glu	ttt Phe	agt Ser 125	1111	aaa Lys	cta Leu	384
aaa Lys	gat Asp 130	Asn	cat His	gca Ala	cag Gln	ctt Leu 135	. Сту	ata Ile	cag Gln	ggc Gly	gtt Val		gat Asp	gaa Glu	aat Asn	432
gca Ala 145	Lys	aaa Lys	gct Ala	att Ile	tta Leu 150	гга	gca Ala	aat Asn	gca Ala	gcg Ala 155	. Gr	aaa Lys	gat Asp	aag Lys	ggc Gly 160	480
gtt Val	gaa Glu	gaa Glu	a ctt ı Lev	gaa Glu 165	ı Lys	ttg Leu	tco Ser	gga Gly	tca Ser 170	. пес	a gaa 1 Glu	a ago 1 Ser	tta Leu	tca Ser 175	a aaa Lys	528
gca Ala	gct Ala	aaa Lys	a gag s Glu 180	ı Met	g ctt Leu	gct Ala	aat a Asr	tca Ser 185	val	aaa L Lys	a gag s Gli	g ctt ı Lei	aca Thr 190		c cct r Pro	576
	gtg Val															582

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### 52 -8/102

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th, k

#### 53 -9/102

							-5/1	02					
											aat Asn		240
											gac Asp 95		288
											gaa Glu		336
											cta Leu		384
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											gct Ala		480
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<213> Borrelia burgdorferi

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# $\frac{54}{-\frac{10}{102}}$

Gln Arg Ala I 145 Glu Leu Glu L	ys Leu	150				TDD					100	
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aat gca tct a Asn Ala Ser S	aca aat Thr Asn 20	tct gcc Ser Ala	gat Asp	gag Glu 25	tct Ser	gtt Val	aaa Lys	Gly ggg	cct Pro 30	aat Asn	ctt Leu	96
aca gaa ata a Thr Glu Ile 3	agt aaa Ser Lys	aaa att Lys Ile	aca Thr	gaa Glu	tct Ser	aac Asn	gca Ala	gtt Val 45	gtt Val	ctg Leu	gcc Ala	144
gtg aaa gaa g Val Lys Glu 50	gtt gag Val Glu	acc tta Thr Let	ı Leu	gca Ala	tct Ser	ata Ile	gat Asp 60	gaa Glu	ctt Leu	gct Ala	acc Thr	192
aaa gct att Lys Ala Ile 65	ggt aag Gly Lys	aaa ata Lys Ile 70	a ggc e Gly	aat Asn	aat Asn	ggt Gly 75	tta Leu	gag Glu	gcc Ala	aat Asn	cag Gln 80	240
agt aaa aac Ser Lys Asn	aca tca Thr Ser 85	ttg tta Leu Le	a tca ı Ser	gga Gly	gct Ala 90	tat Tyr	gca Ala	ata Ile	tct Ser	gac Asp 95	cta Leu	288
ata gca gaa Ile Ala Glu	aaa tta Lys Leu 100	aat gt Asn Va	a ttg l Leu	aaa Lys 105	Asn	gaa Glu	gaa Glu	tta Leu	aag Lys 110	GIU	aag Lys	336
att gat aca Ile Asp Thr 115	gct aag Ala Lys	caa tg Gln Cy	t tct s Ser 120	Thr	gaa Glu	ttt Phe	act Thr	aat Asn 125	гру	cta Leu	aaa Lys	384
agt gaa cat Ser Glu His 130	gca gtg Ala Val	ctt gg Leu Gl 13	у ьеи	gac Asp	aat Asn	ctt Leu	act Thr 140	ASP	gat Asp	aat Asn	gca Ala	432
caa aga gct Gln Arg Ala 145	att tta Ile Leu	aaa aa Lys Ly 150	a cat s His	gca Ala	a aat a Asr	aaa Lys 155	ASE	aag Lys	ggt Gly	gct Ala	gca Ala 160	480

# 55 -11/102

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Al.t

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					act Thr						192
					ata Ile 70						240
					tta Leu						288
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Asp	His	Asn	Gly	Ser 85	Leu	Ile	Ser	Gly	Ala 90	Tyr	Leu	Ile	Ser	Asn 95	Leu	
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		115		Ala			120					125				
	130			Thr		135					140					
145				Ile	150					155					160	
				Lys 165					170					1/5	АТА	
Ala	Lys	Glu	Met 180	Leu	Thr	Asn	Ser	Val 185	Lys	Glu	Leu	Tnr	190	PIO		
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aat Asn	aca Thr	tct Ser	gca Ala 20	aat Asn	tct Ser	gct Ala	gat Asp	gag Glu 25	tct Ser	gtt Val	aaa Lys	ggg ggg	cct Pro 30	aat Asn	ctt Leu	96
aca Thr	gaa Glu	ata Ile 35	agt Ser	aaa Lys	aaa Lys	att Ile	aca Thr 40	gaa Glu	tct Ser	aac Asn	gca Ala	gtt Val 45	gtt Val	ctg Leu	gct Ala	144
gtg Val	aaa Lys 50	gaa Glu	att Ile	gaa Glu	act Thr	ttg Leu 55	ctt Leu	gca Ala	tct Ser	ata Ile	gat Asp 60	gaa Glu	ctt Leu	gct	act Thr	192
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gtg Val	ggt Gly	caa Gln	aac Asn	gga Gly 85	tca Ser	ttg Leu	cta Leu	gca Ala	gga Gly 90	Ala	tat Tyr	gca Ala	atc Ile	tca Ser 95	act Thr	288
gta Val	ata Ile	ata Ile	gaa Glu 100	aaa Lys	ttg Leu	agc Ser	aca Thr	tta Leu 105	Lys	aat Asn	gta Val	gaa Glu	gaa Glu 110	Leu	aaa Lys	336
gaa Glu	aaa Lys	att Ile 115	Thr	aag Lys	gct Ala	aag Lys	gat Asp 120	Cys	tct	gaa Glu	aaa Lys	ttc Phe 125	Thr	aaa Lys	aaa Lys	384

# 5 8 14/102

tta aaa gat agc cgc gca gag ctt ggt aaa aaa gat gcc agt gat gat 432 Leu Lys Asp Ser Arg Ala Glu Leu Gly Lys Lys Asp Ala Ser Asp Asp 135 130 gat gca aaa aaa gct att tta aaa aca aat caa gct aac gat aag ggt 480 Asp Ala Lys Lys Ala Ile Leu Lys Thr Asn Gln Ala Asn Asp Lys Gly 150 gct aaa gaa ctt aaa gag tta ttt gaa gca gta gaa agc ttg tca aaa Ala Lys Glu Leu Lys Glu Leu Phe Glu Ala Val Glu Ser Leu Ser Lys 165 170 553 gcg gct aaa gag atg cta aac aag t Ala Ala Lys Glu Met Leu Asn Lys 180 <210> 20 <211> 184 <212> PRT <213> Borrelia burgdorferi <400> 20 Met Thr Leu Phe Leu Phe Ile Ser Cys Asn Asn Ser Gly Lys Asp Gly 1 Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu 20 25 Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala 40 45 Val Lys Glu Ile Glu Thr Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr 60 55 Lys Ala Ile Gly Lys Lys Ile Asp Asn Ala Gly Leu Gly Ala Glu 70 75 Val Gly Gln Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr 85 90 Val Ile Ile Glu Lys Leu Ser Thr Leu Lys Asn Val Glu Glu Leu Lys 105 Glu Lys Ile Thr Lys Ala Lys Asp Cys Ser Glu Lys Phe Thr Lys Lys 120 125 Leu Lys Asp Ser Arg Ala Glu Leu Gly Lys Lys Asp Ala Ser Asp Asp 140 130 135 Asp Ala Lys Lys Ala Ile Leu Lys Thr Asn Gln Ala Asn Asp Lys Gly 155 150 Ala Lys Glu Leu Lys Glu Leu Phe Glu Ala Val Glu Ser Leu Ser Lys 165 170 Ala Ala Lys Glu Met Leu Asn Lys 180 <210> 21 <211> 582 <212> DNA <213> Borrelia burgdorferi <220> <221> CDS <222> (1) ... (582)

<400> 21

					ttt Phe											48
					tct Ser											96
					aaa Lys											144
					act Thr											192
					aaa Lys 70											240
					aca Thr											288
					tta Leu											336
					gct Ala											384
					gcg Ala											432
aat Asn 145	gca Ala	aaa Lys	aaa Lys	gct Ala	att Ile 150	tta Leu	ata Ile	aca Thr	gat Asp	gca Ala 155	gct Ala	aaa Lys	gat Asp	aag Lys	ggc Gly 160	480
					aag Lys											528
					ctt Leu							Leu				576
att Ile	gtg Val															582

<210> 22 <211> 194

<212> PRT <213> Borrelia burgdorferi

<400> 22

# 60 -<del>16/102</del>

Met Thr Leu Phe Leu Phe Ile Ser Cys Asn Asn Ser Gly Lys Asp Gly 10 Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu 25 Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala 40 Val Lys Glu Ile Glu Thr Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr 55 Lys Ala Ile Gly Lys Lys Ile Gln Gln Asn Gly Gly Leu Ala Val Glu 70 Ala Gly His Asn Gly Thr Leu Leu Ala Gly Ala Tyr Thr Ile Ser Lys 90 Leu Ile Thr Gln Lys Leu Asp Gly Leu Lys Asn Ser Glu Lys Leu Lys 110 105 Glu Lys Ile Glu Asn Ala Lys Lys Cys Ser Glu Asp Phe Thr Lys Lys 125 120 Leu Glu Gly Glu His Ala Gln Leu Gly Ile Glu Asn Val Thr Asp Glu 140 135 Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala Lys Asp Lys Gly 155 150 Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val Glu Asn Leu Ala Lys 170 165 Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Ile Val <210> 23 <211> 1128 <212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1)...(1128) <400> 23 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct 48 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser

gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa

Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys

att acg gat tct aat gcg gtt tta ctt gct gtg aaa gag gtt gaa gcg

Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala

ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa

Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys

35

96

144

192

Al t

# 61

ata cac Ile His 65	Gln	Asn .	Asn (	70	Leu	Asp	1111	GIU	75				-	80	240
ttg tta Leu Leu	gcg Ala	gga Gly	gct Ala 85	tat Tyr	gca Ala	ata Ile	tca Ser	acc Thr 90	cta Leu	ata Ile	aaa Lys	caa Gln	aaa Lys 95	tta Leu	288
gat gga Asp Gly	ttg Leu	aaa Lys 100	aat Asn	gaa Glu	gga Gly	tta Leu	aag Lys 105	gaa Glu	aaa Lys	att Ile	gat Asp	gcg Ala 110	gct Ala	aag Lys	336
aaa tgt Lys Cys	tct Ser 115	gaa Glu	aca Thr	ttt Phe	act Thr	aat Asn 120	aaa Lys	tta Leu	aaa Lys	gaa Glu	aaa Lys 125	cac His	aca Thr	gat Asp	384
ctt ggt Leu Gly 130	Lys	gaa Glu	ggt Gly	gtt Val	act Thr 135	gat Asp	gct Ala	gat Asp	gca Ala	aaa Lys 140	gaa Glu	gcc Ala	att Ile	tta Leu	432
aaa aca Lys Thr 145	aat Asn	ggt Gly	act Thr	aaa Lys 150	act Thr	aaa Lys	ggt Gly	gct Ala	gaa Glu 155	gaa Glu	ctt Leu	gga Gly	aaa Lys	tta Leu 160	480
ttt gaa Phe Gli	a tca ı Ser	gta Val	gag Glu 165	gtc Val	ttg Leu	tca Ser	aaa Lys	gca Ala 170	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 175	gct Ala	528
aat toa Asn Se	a gtt r Val	aaa Lys 180	gag Glu	ctt Leu	aca Thr	agc Ser	cct Pro 185	gtt Val	gtg Val	gca Ala	gaa Glu	agt Ser 190	cca Pro	gcc	576
atg gt Met Va	a aat l Asn 195	Asn	tca Ser	gly aaa	aaa Lys	gat Asp 200	о стх	aat Asn	aca Thr	tct Sei	gca Ala 205		tct Ser	gct Ala	624
gat ga Asp Gl 21	u Ser	gtt Val	aaa Lys	Gly	cct Pro 215	ASI	ctt Leu	aca Thr	gaa Glu	a ata 1 Ile 22		aaa Lys	aaa Lys	att : Ile	672
aca ga Thr Gl 225	a tct u Ser	aac Asr	gca Ala	. Val	. vaı	. ьег	gco 1 Ala	l va.	г шуа	9 61	a gtt u Val	gaa Glu	act Thi	ttg Leu 240	720
ctt ac Leu Th	a tct ir Sei	ata Ile	a gat e Asp 245	GIU	g ctt 1 Lei	gct Ala	a aaa a Lys	gct Ala 250	7 TT	t gg e Gl	t aaa y Lys	a aaa s Lys	a ata 5 Ile 25!		768
aac ga Asn As	it gti sp Val	agt Sei 260	r Lei	a gat ı Asp	aat Asi	gaq n Gli	g gca u Ala 269	A AS	t cae p Hi	c aa s As	c ggg	a tca y Se: 27		a ata u Ile	816
tca gg Ser Gl	ga gca ly Ala 27	а Ту:	t tta r Lei	a att	t tca e Se:	a aa r As: 28	n Le	a at u Il	a ac e Th	a aa r Ly	a aa s Ly 28		a ag e Se	t gca r Ala	864
ata aa Ile Ly 29	aa ga ys As 90	t tc p Se	a gga r Gl	a gaa y Gl	a tte u Le 29	uьy	g gc s Al	a ga a Gl	a at u Il	t ga e Gl 30		g gc s Al	t aa a Ly	g aaa s Lys	912

en.t

# 62 <del>18/102</del>

tgt Cys 305	tct Ser	gaa Glu	gaa Glu	ttt Phe	act Thr 310	gct Ala	aaa Lys	tta Leu	aaa Lys	ggt Gly 315	gaa Glu	cac His	aca Thr	gat Asp	ctt Leu 320	960
ggt Gly	aaa Lys	gaa Glu	ggc Gly	gtt Val 325	act Thr	gat Asp	gat Asp	aat Asn	gca Ala 330	aaa Lys	aaa Lys	gcc Ala	att Ile	tta Leu 335	aaa Lys	1008
aca Thr	aat Asn	aat Asn	gat Asp 340	aaa Lys	act Thr	aag Lys	ggc Gly	gct Ala 345	gat Asp	gaa Glu	ctt Leu	gaa Glu	aag Lys 350	tta Leu	ttt Phe	1056
gaa Glu	tca Ser	gta Val 355	aaa Lys	aac Asn	ttg Leu	tca Ser	aaa Lys 360	gca Ala	gct Ala	aaa Lys	gag Glu	atg Met 365	ctt Leu	act Thr	aat Asn	1104
tca Ser	gtt Val 370	aaa Lys	gag Glu	ctt Leu	aca Thr	agc Ser 375	taa *									1128
<211 <212		75 RT	icia	l Se	quen	ce										
<223	3> 0:	spC (	Chim	era												
Met	0> 2 <sup>4</sup> Ala	4 Cys	Asn	Asn 5	Ser	Gly	Lys	Asp	Gly 10	Asn	Thr	Ser	Ala	Asn 15	Ser	
			20	Val				25	Leu				30		Lys	
		35	Ser				40					45			Ala	
	ΓΛ.	Ser				55					60	Ile			Lys	
65	His	Gln	Asn	λan	C1.0	т от	7							~77.		
0.5					70					/5		His			00	
			Gly	Ala	70 Tyr	Ala	Ile	Ser	Thr	Leu	Ile	Lys	Gln	Lys	Leu	
Asp	Gly	Leu	Gly Lys	Ala 85 Asn	70 Tyr Glu	Ala Gly	Ile Leu	Ser Lys 105	Thr 90 Glu	Leu Lys	Ile	Lys Asp	Gln Ala 110	Lys 95 Ala	Leu Lys	
Asp Lys	Gly Cys	Leu Ser	Gly Lys 100	Ala 85 Asn Thr	70 Tyr Glu Phe	Ala Gly Thr	Leu Asn	Ser Lys 105 Lys	Thr 90 Glu Leu	Leu Lys	Ile Ile Glu	Lys Asp Lys 125	Gln Ala 110 His	Lys 95 Ala Thr	Leu Lys Asp	
Asp Lys Leu	Gly Cys Gly	Ser 115	Gly Lys 100 Glu	Ala 85 Asn Thr	70 Tyr Glu Phe Val	Ala Gly Thr	Leu Asn 120 Asp	Lys 105 Lys Ala	Thr 90 Glu Leu Asp	Lys Ala	Ile Ile Glu Lys 140	Lys Asp Lys 125 Glu	Gln Ala 110 His	Lys 95 Ala Thr	Leu Lys Asp	
Asp Lys Leu Lys	Gly Cys Gly 130 Thr	Ser 115 Lys	Gly Lys 100 Glu Glu	Ala 85 Asn Thr Gly	70 Tyr Glu Phe Val	Ala Gly Thr Thr 135	Leu Asn 120 Asp	Ser Lys 105 Lys Ala	Thr 90 Glu Leu Asp	Lys Lys Ala Glu	Ile Ile Glu Lys 140	Lys Asp Lys 125 Glu Leu	Gln Ala 110 His Ala	Lys 95 Ala Thr Ile	Leu Lys Asp Leu Leu Leu 160	
Asp Lys Leu Lys 145 Phe	Gly Cys Gly 130 Thr	Ser 115 Lys Asr	Gly Lys 100 Glu Glu Gly Cly	Ala 85 Asn Thr Gly Thr	70 Tyr Glu Phe Val Lys 150 Val	Gly Thr 135	Leu Asn 120 Asp	Lys 105 Lys Ala Gly	Thr 90 Glu Leu Asp Ala Ala	Leu Lys Lys Ala Glu 155	Ile Ile Glu Lys 140 Glu	Lys Asp Lys 125 Glu Leu Glu	Gln Ala 110 His Ala Gly	Lys 95 Ala Thr Ile Lys Let	Leu Lys Asp Leu Leu 160 Ala	
Asp Lys Leu Lys 145 Phe	Gly Cys Gly 130 Thr	Ser 115 Lys Asn Ser Val	Gly Lys 100 Glu Glu Gly Val	Ala 85 Asn Thr Gly Thr 165 Gli	70 Tyr Glu Phe Val Lys 150 Val	Ala Gly Thr 135 Thr Leu	Leu Asn 120 Asp Lys Ser Ser	Lys 105 Lys Ala Gly Lys	Thr 90 Glu Leu Asp Ala 170 Val	Leu Lys Lys Ala Glu 155 Ala	Ile Ile Glu Lys 140 Glu Lys	Lys Asp Lys 125 Glu Leu Glu Glu	Gln Ala 110 His Ala Gly Met	Lys 95 Ala Thr Ile Lys Let 175	Leu Lys Asp Leu 160 Ala Ala	
Asp Lys Leu Lys 145 Phe Asn	Gly Cys Gly 130 Thr Glu Ser	Ser 115 Lys Asn Ser Val	Gly Lys 100 Glu Glu Gly Val Lys 180	Ala 85 Asn Thr Gly Thr 1 Gli 165 Gli On Ser	70 Tyr Glu Phe Val Lys 150 Val Lot Gly	Ala Gly Thr Thr 135 Thr Lev Thr	Leu Asn 120 Asp Lys Ser Ser Ser 200	Lys 105 Lys Ala Gly Lys Pro 185	Thr 90 Glu Leu Asp Ala 170 Val	Leu Lys Ala Glu 155 Ala Val	Ile Ile Glu Lys 140 Glu Lys Ala	Lys Asp Lys 125 Glu Leu Glu Ala 205	Gln Ala 110 His Ala Gly Met	Lys 95 Ala Thr Ile Lys Let 175 Pro	Leu Lys Asp Leu Leu 160 Ala	

Ch. 4

# 63 -<del>19/10</del>2

Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu Thr Leu 235 230 225 Leu Thr Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile Lys 250 245 Asn Asp Val Ser Leu Asp Asn Glu Ala Asp His Asn Gly Ser Leu Ile 265 260 Ser Gly Ala Tyr Leu Ile Ser Asn Leu Ile Thr Lys Lys Ile Ser Ala 285 280 275 Ile Lys Asp Ser Gly Glu Leu Lys Ala Glu Ile Glu Lys Ala Lys Lys 300 295 290 Cys Ser Glu Glu Phe Thr Ala Lys Leu Lys Gly Glu His Thr Asp Leu 310 315 305 Gly Lys Glu Gly Val Thr Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys 330 325 Thr Asn Asn Asp Lys Thr Lys Gly Ala Asp Glu Leu Glu Lys Leu Phe 350 345 340 Glu Ser Val Lys Asn Leu Ser Lys Ala Ala Lys Glu Met Leu Thr Asn 365 360 355 Ser Val Lys Glu Leu Thr Ser 370 <210> 25 <211> 1124 <212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1) ... (1124) <400> 25 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 5 gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa 96 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 25 20 att acg gat tct aat gcg gtt tta ctt gct gtg aaa gag gtt gaa gcg 144 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 35 ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa 192 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys 50 55 ata cac caa aat aat ggt ttg gat acc gaa tat aat cac aat gga tca 240 Ile His Gln Asn Asn Gly Leu Asp Thr Glu Tyr Asn His Asn Gly Ser 70 ttg tta gcg gga gct tat gca ata tca acc cta ata aaa caa aaa tta 288 Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr Leu Ile Lys Gln Lys Leu 85

GU.X

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gat g Asp (	gga Bly	ttg Leu	aaa Lys 100	aat Asn	gaa Glu	gga Gly	tta Leu	aag Lys 105	gaa Glu	aaa Lys	att Ile	ga As	t g p P	gcg Ala L10	gct Ala	aag Lys	336
aaa t Lys (	tgt Cys	tct Ser 115	gaa Glu	aca Thr	ttt Phe	act Thr	aat Asn 120	aaa Lys	tta Leu	aaa Lys	gaa Glu	a aa 1 Ly 12	_	cac His	aca Thr	gat Asp	384
ctt ( Leu (	ggt Gly 130	aaa Lys	gaa Glu	ggt Gly	gtt Val	act Thr 135	gat Asp	gct Ala	gat Asp	gca Ala	aaa Lys 140		u i	gcc Ala	att Ile	tta Leu	432
aaa Lys 145	Thr	Asn	Gly	Thr	Lys 150	Thr	гуѕ	GIY	Ala	155				1	•	160	480
ttt Phe	gaa Glu	tca Ser	gta Val	gag Glu 165	gtc Val	ttg Leu	tca Ser	aaa Lys	gca Ala 170		aa Ly	a ga s Gi	ag lu	atg Met	ctt Leu 175	gct Ala	528
aat Asn	tca Ser	gtt Val	aaa Lys 180	gag Glu	ctt Leu	aca Thr	agc Ser	cct Pro 185	gtt Val	gtg Val	g gc L Al	a g	aa lu	agt Ser 190	cca Pro	gcc Ala	576
atg Met	gta Val	aat Asn 195	Asn	tca Ser	gga Gly	aaa Lys	gat Asp 200	ggg Gly	aat Asr	aca n Thi	a to r Se		ca la 05	aat Asn	tct Ser	gct Ala	624
gat Asp	gag Glu 210	Ser	gtt Val	aaa Lys	ggg Gly	cct Pro 215	ASI	ctt Leu	aca Thi	a gaa r Gli	a at u Il 22		gt er	aaa Lys	aaa Lys	att	672
aca Thr 225	gaa Glu	tct Ser	aac Asn	gca Ala	gtt Val 230	. val	ctg Lei	g gct ı Ala	gte Va	g aa l Ly 23		aa a lu I	tt le	gaa Glu	act Thr	ttg Leu 240	720
ctt Leu	gca Ala	tct Sei	ata 11e	gat Asp 245	GI	a ctt 1 Lei	gct 1 Ala	t act a Thi	: aa : Ly 25	o vr	t at a II	t g le G	gt Bly	aaa Lys	a aaa E Lys 255	ata Ile	768
caa Gln	caa Glr	a aat n Asi	ggt n Gly 260	/ Gly	tta Lei	a gci	t gt a Va	c gaa 1 Glu 26!	J AT	g gg a Gl	g ca	10 1	1011	gga Gl <sub>y</sub> 270		a ttg r Leu	816
tta Leu	gca Ala	a gg a Gl	y Ala	tat a Ty	aca r Th	a at r Il	a tc e Se 28	г гу	a ct s Le	a at u Il	a a .e T		caa Gln 285		a tta s Le	a gat u Asp	864
gga Gly	ttg Lei 29	u Ly	a aat s Ast	t tca n Se	a ga r Gl	a aa u Ly 29	з ье	a aa u Ly	g ga s Gl	ia aa .u Ly	, 5 1	tt 9 le 9 00	gaa Glu	aa As:	t gc n Al	t aag a Lys	912
Lys 305	cy 5	s Se	r Gl	u As	p Ph 31	e Th	т Бу	'в шу	\$ DC	3:	15	· - 1	010			g caa a Gln 320	960
ctt Lei	gg u Gl	a at y Il	t ga e Gl	a aa u As 32	n va	t ac	t ga ir As	it ga sp Gl	u A	at go sn A	ca a la I	ıaa .ys	aaa Lys	a gc s Al	t at a Il 33	t tta e Leu 5	1008

er.

# 65 <del>-21/10</del>2

ata Ile	aca Thr	gat Asp	gca Ala 340	gct Ala	aaa Lys	gat Asp	aag Lys	ggc Gly 345	gct Ala	gca Ala	gag Glu	ctt Leu	gaa Glu 350	aag Lys	cta Leu	1056
ttt Phe	aaa Lys	gca Ala 355	gta Val	gaa Glu	aac Asn	ttg Leu	gca Ala 360	aaa Lys	gca Ala	gct Ala	aaa Lys	gag Glu 365	atg Met	ctt Leu	gct Ala	1104
			aaa Lys		ctt Leu	ac										1124
<211 <212		'4 ?T	icial	l Sed	queno	ce										
<223	3 > Os	spC (	Chime	era												
Met		Cys		5					10	Asn				12		
Ala	Asp	Glu	Ser 20	Val	Lys	Gly	Pro	Asn 25	Leu	Thr	Glu	Ile	Ser 30	Lys	Lys	
Ile	Thr	Asp 35	Ser	Asn	Ala	Val	Leu 40		Ala	Val	Lys	Glu 45	Val	Glu	Ala	
Leu	Leu 50	Ser	Ser	Ile	Asp	Glu 55		Ala	Ala	Lys	Ala 60	Ile	Gly	Lys	Lys	
	His	Gln	Asn	Asn	Gly 70	Leu	Asp	Thr	Glu	Tyr 75		His	Asn	Gly	Ser 80	
65 Leu	Leu	Ala	Gly	Ala 85		Ala	Ile	Ser	Thr 90	Leu	Ile	Lys	Gln	Lys 95	Leu	
Asp	Gly	Leu		Asn	Glu	Gly	Leu	Lys 105	Glu	Lys	Ile	Asp	Ala 110	Ala	Lys	
Lys	Cys		100 Glu	Thr	Phe	Thr	Asn 120	Lys		Lys	Glu	Lys 125	His		Asp	
Leu		115 Lys	Glu	Gly	Val	Thr			Asp	Ala	Lys 140	Glu		Ile	Leu	
	130 Thr	Asn	Gly	Thr	Lys	Thr	Lys	Gly	Ala	Glu 155	Glu		Gly	Lys	Leu 160	
Phe	Glu	Ser	Val	Glu	Val	Leu	Ser	Lys	Ala 170	Ala	Lys	Glu	Met	Leu 175	Ala	
Asn	Ser	Val			Leu	Thr	Ser	Pro	Val		Ala	Glu	Ser 190	Pro	Ala	
Met	Val			Ser	Gly	Lys	Asp	Gly		Thr	Ser	Ala 205	Asn		Ala	
Asp			Val	Lys	Gly	Pro 215	Asn		Thr	Glu	Ile 220	Ser		Lys	Ile	
		Ser	Asn	Ala	Val 230	Val		Ala	Val	Lys 235	Glu		Glu	Thr	Leu 240	
225 Leu	Ala	Ser	Ile	Asp	Glu	Leu	Ala	Thr	Lys 250	Ala		Gly	Lys	Lys 255	Ile	
Gln	Gln	Asn		Gly	Leu	Ala	Val	Glu 265	ı Ala		His	Asn	Gly 270	Thr	Leu	
Leu	Ala	Gly 275		Tyr	Thr	· Ile	Ser 280	Lys		ılle	Thr	Glr 285	Lys		Asp	

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Gly Leu Lys Asn Ser Glu Lys Leu Lys Glu Lys Ile Glu Asn Ala Lys

300 290 295 Lys Cys Ser Glu Asp Phe Thr Lys Lys Leu Glu Gly Glu His Ala Gln 315 310 Leu Gly Ile Glu Asn Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu 325 330 Ile Thr Asp Ala Ala Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu 345 Phe Lys Ala Val Glu Asn Leu Ala Lys Ala Ala Lys Glu Met Leu Ala 360 Asn Ser Val Lys Glu Leu 370 <210> 27 <211> 1137 <212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1) . . . (1137) <400> 27 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1 gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata aat aaa aaa Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Asn Lys Lys 20 att acg gat tot aat gog gtt tta ott got gtg aaa gag gtt gaa gog Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 35 192 ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys 50 55 240 ata cac caa aat aat ggt ttg gat acc gaa aat aat cac aat gga tca Ile His Gln Asn Asn Gly Leu Asp Thr Glu Asn Asn His Asn Gly Ser 70 65 ttg tta gcg gga gct tat gca ata tca acc cta ata aaa caa aaa tta Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr Leu Ile Lys Gln Lys Leu 95 85 336 Asp Gly Leu Lys Asn Glu Gly Leu Lys Glu Lys Ile Asp Ala Ala Lys 100 110 aaa tgt tct gaa aca ttt act aat aaa tta aaa gaa aaa cac aca gat Lys Cys Ser Glu Thr Phe Thr Asn Lys Leu Lys Glu Lys His Thr Asp

120

115

125

Gr.X

# 67 -<del>23/102</del>

ctt Leu	ggt Gly 130	aaa Lys	gaa Glu	ggt Gly	gtt Val	act Thr 135	gat Asp	gct Ala	gat Asp	gca Ala	aaa Lys 140	gaa Glu	gcc Ala	att Ile	tta Leu	432
aaa Lys 145	gca Ala	aat Asn	ggt Gly	act Thr	aaa Lys 150	act Thr	aaa Lys	ggt Gly	gct Ala	gaa Glu 155	gaa Glu	ctt Leu	gga Gly	aaa Lys	tta Leu 160	480
ttt Phe	gaa Glu	tca Ser	gta Val	gag Glu 165	gtc Val	ttg Leu	tca Ser	aaa Lys	gca Ala 170	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 175	gct Ala	528
						aca Thr										576
aaa Lys	cct Pro	tcc Ser 195	atg Met	gta Val	aat Asn	aat Asn	tca Ser 200	Gly 999	aaa Lys	gat Asp	Gly 999	aat Asn 205	aca Thr	tct Ser	gca Ala	624
						gtt Val 215										672
						aac Asn										720
						ata Ile										768
						agt Ser										816
						tat Tyr										864
						tca Ser 295										912
_	_		_		_	gaa Glu			_							960
						ggc Gly										1008
						gat Asp										1056
						aaa Lys										1104

Sw. L

1137

Leu Thr Asn Ser Val Lys Glu Leu Thr Ser \* <210> 28 <211> 378 <212> PRT <213> Artificial Sequence <220> <223> OspC Chimera <400> 28 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 10 5 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Asn Lys Lys 25 20 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 40 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys 60 55 Ile His Gln Asn Asn Gly Leu Asp Thr Glu Asn Asn His Asn Gly Ser 75 70 Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr Leu Ile Lys Gln Lys Leu 90 Asp Gly Leu Lys Asn Glu Gly Leu Lys Glu Lys Ile Asp Ala Ala Lys 110 105 Lys Cys Ser Glu Thr Phe Thr Asn Lys Leu Lys Glu Lys His Thr Asp 100 125 120 115 Leu Gly Lys Glu Gly Val Thr Asp Ala Asp Ala Lys Glu Ala Ile Leu 140 135 Lys Ala Asn Gly Thr Lys Thr Lys Gly Ala Glu Glu Leu Gly Lys Leu 1.55 150 Phe Glu Ser Val Glu Val Leu Ser Lys Ala Ala Lys Glu Met Leu Ala 170 165 Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val Ala Glu Ser Pro Lys 185 Lys Pro Ser Met Val Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala 180

ctt act aat tca gtt aaa gag ctt aca agc taa

Glu Thr Leu Leu Thr Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys 250 245 Lys Ile Lys Asn Asp Val Ser Leu Asp Asn Glu Ala Asp His Asn Gly

Lys Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val

200 Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser

215

230

205

220

235

265 Ser Leu Ile Ser Gly Ala Tyr Leu Ile Ser Asn Leu Ile Thr Lys Lys

280 Ile Ser Ala Ile Lys Asp Ser Gly Glu Leu Lys Ala Glu Ile Glu Lys

295 Ala Lys Lys Cys Ser Glu Glu Phe Thr Ala Lys Leu Lys Gly Glu His

315 310 Thr Asp Leu Gly Lys Glu Gly Val Thr Asp Asp Asn Ala Lys Lys Ala 330 325

Ile Leu Lys Thr Asn Asn Asp Lys Thr Lys Gly Ala Asp Glu Leu Glu 345 340

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Lys Leu Phe Glu Ser Val Lys Asn Leu Ser Lys Ala Ala Lys Glu Met 355 360 365 Leu Thr Asn Ser Val Lys Glu Leu Thr Ser 370 375

<210> 29
<211> 1133
<212> DNA
<213> Artificial Sequence
<220>
<223> OspC Chimera
<221> CDS

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<222> (1)...(1133)

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ttt Phe	gaa Glu	tca Ser	gta Val	gag Glu 165	gtc Val	ttg Leu	tca Ser	aaa Lys	gca Ala 170	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 175	gct Ala	528
aat Asn	tca Ser	gtt Val	aaa Lys 180	gag Glu	ctt Leu	aca Thr	agc Ser	cct Pro 185	gtt Val	gtg Val	gca Ala	gaa Glu	agt Ser 190	cca Pro	aaa Lys	576
aaa Lys	cct Pro	tcc Ser 195	atg Met	gta Val	aat Asn	aat Asn	tca Ser 200	gga Gly	aaa Lys	gat Asp	ggg Gly	aat Asn 205	aca Thr	tct Ser	gca Ala	624
aat Asn	tct Ser 210	gct Ala	gat Asp	gag Glu	tct Ser	gtt Val 215	aaa Lys	ggg Gly	cct Pro	aat Asn	ctt Leu 220	aca Thr	gaa Glu	ata Ile	agt Ser	672
aaa Lys 225	aaa Lys	att Ile	aca Thr	gaa Glu	tct Ser 230	aac Asn	gca Ala	gtt Val	gtt Val	ctg Leu 235	gct Ala	gtg Val	aaa Lys	gaa Glu	att Ile 240	720
gaa Glu	act Thr	ttg Leu	ctt Leu	gca Ala 245	tct Ser	ata Ile	gat Asp	gaa Glu	ctt Leu 250	gct Ala	act Thr	aaa Lys	gct Ala	att Ile 255	ggt Gly	768
aaa Lys	aaa Lys	ata Ile	caa Gln 260	caa Gln	aat Asn	ggt Gly	ggt Gly	tta Leu 265	gct Ala	gtc Val	gaa Glu	gcg Ala	999 Gly 270	cat His	aat Asn	816
gga Gly	aca Thr	ttg Leu 275	tta Leu	gca Ala	ggt Gly	gct Ala	tat Tyr 280	aca Thr	ata Ile	tca Ser	aaa Lys	cta Leu 285	ata Ile	aca Thr	caa Gln	864
aaa Lys	tta Leu 290	gat Asp	gga Gly	ttg Leu	aaa Lys	aat Asn 295	tca Ser	gaa Glu	aaa Lys	tta Leu	aag Lys 300	gaa Glu	aaa Lys	att Ile	gaa Glu	912
aat Asn 305	gct Ala	aag Lys	aaa Lys	tgt Cys	tct Ser 310	gaa Glu	gat Asp	ttt Phe	act Thr	aaa Lys 315	aaa Lys	cta Leu	gaa Glu	gga Gly	gaa Glu 320	960
cat His	gcg Ala	caa Gln	ctt Leu	gga Gly 325	att Ile	gaa Glu	aat Asn	gtt Val	act Thr 330	gat Asp	gag Glu	aat Asn	Ala	aaa Lys 335	Lys	1008
gct Ala	att Ile	tta Leu	ata Ile 340	Thr	gat Asp	gca Ala	gct Ala	aaa Lys 345	Asp	aag Lys	ggc Gly	gct Ala	gca Ala 350	gag Glu	ctt Leu	1056
gaa Glu	aag Lys	cta Leu 355	ttt Phe	aaa Lys	gca Ala	gta Val	gaa Glu 360	Asn	ttg Leu	gca Ala	aaa Lys	gca Ala 365	Ala	aaa Lys	gag Glu	1104
atg Met	ctt Leu 370	Ala	aat Asn	tca Ser	gtt Val	aaa Lys 375	Glu	ctt Leu	ac							1133

Chi.

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375

ti.x

### 72 38/102

<212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1) . . . (1112) <400> 31 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys att acg gat tot aat gcg gtt tta ott gct gtg aaa gag gtt gaa gcg Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 35 ttg ctg tca tct ata gat gag ctt gct aaa gct att ggt aaa aaa ata Leu Leu Ser Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile 50 aaa aac gat ggt agt tta gat aat gaa gca aat cgc aac gag tca ttg Lys Asn Asp Gly Ser Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu tta gca gga gct tat aca ata tca acc tta ata aca caa aaa tta agt Leu Ala Gly Ala Tyr Thr Ile Ser Thr Leu Ile Thr Gln Lys Leu Ser aaa tta aac gga tca gaa ggt tta aag gaa aag att gcc gca gct aag Lys Leu Asn Gly Ser Glu Gly Leu Lys Glu Lys He Ala Ala Ala Lys 100 aaa tgc tct gaa gag ttt agt act aaa cta aaa gat aat cat gca cag Lys Cys Ser Glu Glu Phe Ser Thr Lys Leu Lys Asp Asn His Ala Gln 115 ctt ggt ata cag ggc gtt act gat gaa aat gca aaa aaa gct att tta Leu Gly Ile Gln Gly Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu 130 aaa gca aat gca gcg ggt aaa gat aag ggc gtt gaa gaa ctt gaa aag Lys Ala Asn Ala Ala Gly Lys Asp Lys Gly Val Glu Leu Glu Lys ttg tcc gga tca tta gaa agc tta tca aaa gca gct aaa gag atg ctt Leu Ser Gly Ser Leu Glu Ser Leu Ser Lys Ala Ala Lys Glu Met Leu gct aat tca gtt aaa gag ctt aca agc cct gtt gtc cat ggt aat aat Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Asn Asn 180

th'x

							tct Ser 200						624
							ata Ile						672
							gaa Glu						720
							att Ile						768
		_		_	_		aac Asn		_			_	816
							gaa Glu 280						864
							aca Thr						912
							cat His						960
	_	_		_		_	gct Ala				_		1008
							gaa Glu						1056
							aca Thr 360						1104
aca Thr	_	cc											1112
<212	.> 37 !> PR	'0 ?T	icial	. Sec	quenc	e							
<220 <223		pC C	Chime	era									
<400	> 32	:											

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Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 10 1 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 25 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Ser Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu 75 Leu Ala Gly Ala Tyr Thr Ile Ser Thr Leu Ile Thr Gln Lys Leu Ser 85 Lys Leu Asn Gly Ser Glu Gly Leu Lys Glu Lys Ile Ala Ala Ala Lys 100 Lys Cys Ser Glu Glu Phe Ser Thr Lys Leu Lys Asp Asn His Ala Gln 115 120 Leu Gly Ile Gln Gly Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu 135 Lys Ala Asn Ala Ala Gly Lys Asp Lys Gly Val Glu Glu Leu Glu Lys 150 145 Leu Ser Gly Ser Leu Glu Ser Leu Ser Lys Ala Ala Lys Glu Met Leu 170 165 Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Asn Asn 180 185 190 Ser Arg Lys Asp Gly Asn Ala Ser Thr Asn Ser Ala Asp Glu Ser Val 205 195 200 Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn 215 Ala Val Val Leu Ala Val Lys Glu Val Glu Thr Leu Leu Ala Ser Ile 230 Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys Ile Gly Asn Asn Gly 245 250 Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser Leu Leu Ser Gly Ala Tyr 270 Ala Ile Ser Asp Leu Ile Ala Glu Lys Leu Asn Val Leu Lys Asn Glu 280 Glu Leu Lys Glu Lys Ile Asp Thr Ala Lys Gln Cys Ser Thr Glu Phe 300 295 Thr Asn Lys Leu Lys Ser Glu His Ala Val Leu Gly Leu Asp Asn Leu 310 Thr Asp Asp Asn Ala Gln Arg Ala Ile Leu Lys Lys His Ala Asn Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val Glu Asn 345 Leu Ser Lys Ala Ala Gln Asp Thr Leu Lys Asn Ala Val Lys Glu Leu 360 Thr Ser 370

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<223> OspC Chimera

<221> CDS <222> (1)...(1113)

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the t

														tct Ser		720
														gtt Val 255		768
														gca Ala		816
														gat Asp		864
														gaa Glu		912
														gaa Glu		960
_		_	_		_			_						aat Asn 335	_	1008
														gta Val		1056
														aaa Lys		1104
	aca Thr 370	_														1113
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	)> 34 Ala		Asn	Asn	Ser	Gly	Lys	Asp	Gly	Asn	Thr	Ser	Ala	Asn	Ser	
1		_		5		_	_	_	10					15 Lys		
Ile	Thr		20 Ser	Asn	Ala	Val		25 Leu	Ala	Val	Lys		30 Val	Glu	Ala	
Leu	Leu 50	35 Ser	Ser	Ile	Asp	Glu 55	40 Leu	Ala	Lys	Ala	Ile 60	45 Gly	Lys	Lys	Ile	

41'X

#### 77 \_33/102-

Lys Asn Asp Gly Ser Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu 65 Leu Ala Gly Ala Tyr Thr Ile Ser Thr Leu Ile Thr Gln Lys Leu Ser 85 90 Lys Leu Asn Gly Ser Glu Gly Leu Lys Glu Lys Ile Ala Ala Lys 105 100 Lys Cys Ser Glu Glu Phe Ser Thr Lys Leu Lys Asp Asn His Ala Gln 120 115 Leu Gly Ile Gln Gly Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu 135 140 Lys Ala Asn Ala Ala Gly Lys Asp Lys Gly Val Glu Glu Leu Glu Lys 150 155 145 Leu Ser Gly Ser Leu Glu Ser Leu Ser Lys Ala Ala Lys Glu Met Leu 170 165 Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Asn Asn 185 Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val 195 200 Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn 215 220 Ala Val Val Leu Ala Val Lys Glu Val Glu Thr Leu Leu Thr Ser Ile 230 235 Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Val Ser 245 250 Leu Asp Asn Glu Ala Asp His Asn Gly Ser Leu Ile Ser Gly Ala Tyr 265 260 Leu Ile Ser Asn Leu Ile Thr Lys Lys Ile Ser Ala Ile Lys Asp Ser 275 280 Gly Glu Leu Lys Ala Glu Ile Glu Lys Ala Lys Lys Cys Ser Glu Glu 295 300 Phe Thr Ala Lys Leu Lys Gly Glu His Thr Asp Leu Gly Lys Glu Gly 305 310 315 Val Thr Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr Asn Asn Asp 325 330 Lys Thr Lys Gly Ala Asp Glu Leu Glu Lys Leu Phe Glu Ser Val Lys 345 Asn Leu Ser Lys Ala Ala Lys Glu Met Leu Thr Asn Ser Val Lys Glu 355 Leu Thr Ser 370 <210> 35 <211> 1112 <212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1) ... (1112) <400> 35 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 10

41,7 Un.7

# 78 <del>34/10</del>2

														aaa Lys		96
att Ile	acg Thr	gat Asp 35	tct Ser	aat Asn	gcg Ala	gtt Val	tta Leu 40	ctt Leu	gct Ala	gtg Val	aaa Lys	gag Glu 45	gtt Val	gaa Glu	gcg Ala	144
														aaa Lys		192
														tca Ser		240
														tta Leu 95		288
														gct Ala		336
														gca Ala		384
														att Ile		432
														gaa Glu		480
														atg Met 175		528
														aat Asn		576
														tct Ser		624
														tct Ser		672
														tct Ser		720
														aat Asn 255		768

th's

# 79 \_<del>35/102</del>

	ggt Gly	tta Leu	gct Ala	gtc Val 260	gaa Glu	gcg Ala	gjà aaa	cat His	aat Asn 265	gga Gly	aca Thr	ttg Leu	tta Leu	gca Ala 270	ggt Gly	gct Ala	816
	tat Tyr	aca Thr	ata Ile 275	tca Ser	aaa Lys	cta Leu	ata Ile	aca Thr 280	caa Gln	aaa Lys	tta Leu	gat Asp	gga Gly 285	ttg Leu	aaa Lys	aat Asn	864
	tca Ser	gaa Glu 290	aaa Lys	tta Leu	aag Lys	gaa Glu	aaa Lys 295	att Ile	gaa Glu	aat Asn	gct Ala	aag Lys 300	aaa Lys	tgt Cys	tct Ser	gaa Glu	912
	gat Asp 305	ttt Phe	act Thr	aaa Lys	aaa Lys	cta Leu 310	gaa Glu	gga Gly	gaa Glu	cat His	gcg Ala 315	caa Gln	ctt Leu	gga Gly	att Ile	gaa Glu 320	960
	aat Asn	gtt Val	act Thr	gat Asp	gag Glu 325	aat Asn	gca Ala	aaa Lys	aaa Lys	gct Ala 330	att Ile	tta Leu	ata Ile	aca Thr	gat Asp 335	gca Ala	1008
را	gct Ala	aaa Lys	gat Asp	aag Lys 340	ggc Gly	gct Ala	gca Ala	gag Glu	ctt Leu 345	gaa Glu	aag Lys	cta Leu	ttt Phe	aaa Lys 350	gca Ala	gta Val	1056
+								aaa Lys 360									1104
	gag Glu	ctt Leu 370	ac														1112
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	<220> <223> OspC Chimera																
	<400	)> 36	5														
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		Asp	Glu	Ser 20	Val	Lys	Gly	Pro	Asn 25	Leu	Thr	Glu	,Ile	Ser 30	Lys	Lys	
	Ile	Thr			Asn	Ala	Val	Leu		Ala	Val	Lys			Glu	Ala	
	Leu		35 Ser	Ser	Ile	Asp		40 Leu	Ala	Lys	Ala		45 Gly	Lys	Lys	Ile	
	_	50 Asn	Asp	Gly	Ser		55 Asp	Asn	Glu	Ala		60 Arg	Asn	Glu	Ser		
	65 Leu	Ala	Gly	Ala		70 Thr	Ile	Ser	Thr		75 Ile	Thr	Gln	Lys		80 Ser	
	Lys	Leu	Asn	_	85 Ser	Glu	Gly	Leu		90 Glu	Lys	Ile	Ala		95 Ala	Lys	
	Lys	Cys		100 Glu	Glu	Phe	Ser	Thr	105 Lys	Leu	Lys	Asp	Asn 125	110 His	Ala	Gln	
			115					120					123				

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#### 80 -36/102

Leu Gly Ile Gln Gly Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu 135 140 Lys Ala Asn Ala Ala Gly Lys Asp Lys Gly Val Glu Glu Leu Glu Lys 150 155 160 Leu Ser Gly Ser Leu Glu Ser Leu Ser Lys Ala Ala Lys Glu Met Leu 170 Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Asn Asn 190 185 Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val 205 200 Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn 215 220 Ala Val Val Leu Ala Val Lys Glu Ile Glu Thr Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys Ile Gln Gln Asn Gly 250 Gly Leu Ala Val Glu Ala Gly His Asn Gly Thr Leu Leu Ala Gly Ala 265 Tyr Thr Ile Ser Lys Leu Ile Thr Gln Lys Leu Asp Gly Leu Lys Asn 280 285 Ser Glu Lys Leu Lys Glu Lys Ile Glu Asn Ala Lys Lys Cys Ser Glu 295 300 Asp Phe Thr Lys Lys Leu Glu Gly Glu His Ala Gln Leu Gly Ile Glu 315 320 Asn Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala 325 330 335 Ala Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val 350 340 345 Glu Asn Leu Ala Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys 360 Glu Leu 370 <210> 37 <211> 1106 <212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1) . . . (1106) <400> 37 atg gct tgt aat aat tca gga aaa gat ggg aat gca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Ala Ser Ala Asn Ser 1 5 gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 20 att aca gaa tot aac gca gtt gtt ctg gcc gtg aaa gaa gtt gag acc Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu Thr 35

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tta Leu	ctt Leu 50	gca Ala	tct Ser	ata Ile	gat Asp	gaa Glu 55	ctt Leu	gct Ala	acc Thr	aaa Lys	gct Ala 60	att Ile	ggt Gly	aaa Lys	aaa Lys	192
ata Ile 65	ggc Gly	aat Asn	aat Asn	ggt Gly	tta Leu 70	gag Glu	gcc Ala	aat Asn	cag Gln	agt Ser 75	aaa Lys	aac Asn	aca Thr	tca Ser	ttg Leu 80	240
tta Leu	tca Ser	gga Gly	gct Ala	tat Tyr 85	gca Ala	ata Ile	tct Ser	gac Asp	cta Leu 90	ata Ile	gca Ala	gaa Glu	aaa Lys	tta Leu 95	aat Asn	288
gta Val	ttg Leu	aaa Lys	aat Asn 100	gaa Glu	gaa Glu	tta Leu	aag Lys	gaa Glu 105	aag Lys	att Ile	gat Asp	aca Thr	gct Ala 110	aag Lys	caa Gln	336
tgt Cys	tct Ser	aca Thr 115	gaa Glu	ttt Phe	act Thr	aat Asn	aaa Lys 120	cta Leu	aaa Lys	agt Ser	gaa Glu	cat His 125	gca Ala	gtg Val	ctt Leu	384
ggt Gly	ctg Leu 130	gac Asp	aat Asn	ctt Leu	act Thr	gat Asp 135	gat Asp	aat Asn	gca Ala	caa Gln	aga Arg 140	gct Ala	att Ile	tta Leu	aaa Lys	432
aaa Lys 145	cat His	gca Ala	aat Asn	aaa Lys	gat Asp 150	aag Lys	ggt Gly	gct Ala	gca Ala	gaa Glu 155	ctt Leu	gaa Glu	aag Lys	tta Leu	ttt Phe 160	480
aaa Lys	gcg Ala	gta Val	gaa Glu	aac Asn 165	tta Leu	tca Ser	aaa Lys	gca Ala	gct Ala 170	caa Gln	gac Asp	aca Thr	tta Leu	aaa Lys 175	aat Asn	528
gct Ala	gtt Val	aaa Lys	gag Glu 180	ctt Leu	aca Thr	agt Ser	cct Pro	att Ile 185	gtc Val	cat His	ggt Gly	aat Asn	aat Asn 190	tca Ser	aga Arg	576
aaa Lys	gat Asp	999 Gly 195	aat Asn	gca Ala	tct Ser	aca Thr	aat Asn 200	tct Ser	gcc Ala	gat Asp	gag Glu	tct Ser 205	gtt Val	aaa Lys	Gly ggg	624
cct Pro	aat Asn 210	ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 215	aaa Lys	aaa Lys	att Ile	aca Thr	gaa Glu 220	tct Ser	aac Asn	gca Ala	gtt Val	672
gtt Val 225	Leu	gcc Ala	gtg Val	aaa Lys	gaa Glu 230	gtt Val	gag Glu	acc Thr	tta Leu	ctt Leu 235	Ala	tct Ser	ata Ile	gat Asp	gaa Glu 240	720
ctt Leu	gct Ala	acc Thr	aaa Lys	gct Ala 245	att Ile	ggt Gly	aag Lys	aaa Lys	ata Ile 250	ggc Gly	aat Asn	aat Asn	ggt Gly	tta Leu 255	gag Glu	768
gcc Ala	aat Asn	cag Gln	agt Ser 260	Lys	aac Asn	aca Thr	tca Ser	ttg Leu 265	Leu	tca Ser	gga Gly	gct Ala	tat Tyr 270	gca Ala	ata Ile	816
tct Ser	gac Asp	cta Leu 275	ata Ile	gca Ala	gaa Glu	aaa Lys	tta Leu 280	Asn	gta Val	ttg Leu	aaa Lys	aat Asn 285	gaa Glu	gaa Glu	tta Leu	864

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### 82 -38/102

aag gaa aag att gat aca gct aag caa tgt tct a Lys Glu Lys Ile Asp Thr Ala Lys Gln Cys Ser T 290 295 3	ca gaa ttt act aat 912 hr Glu Phe Thr Asn 00
aaa cta aaa agt gaa cat gca gtg ctt ggt ctg g Lys Leu Lys Ser Glu His Ala Val Leu Gly Leu A 305 310 315	ac aat ctt act gat 960 sp Asn Leu Thr Asp 320
gat aat gca caa aga gct att tta aaa aaa cat g Asp Asn Ala Gln Arg Ala Ile Leu Lys Lys His A 325 330	ca aat aaa gat aag 1008 la Asn Lys Asp Lys 335
ggt gct gca gaa ctt gaa aag tta ttt aaa gcg g Gly Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala V 340 345	ta gaa aac tta tca 1056 Val Glu Asn Leu Ser 350
aaa gca gct caa gac aca tta aaa aat gct gtt a Lys Ala Ala Gln Asp Thr Leu Lys Asn Ala Val L 355 360	laa gag ctt aca agt 1104 Lys Glu Leu Thr Ser 365
cc	1106
<210> 38 <211> 368 <212> PRT <213> Artificial Sequence <220> <223> OspC Chimera	
(225) 00p0 01111110111	
-400 \ 38	
<pre>&lt;400&gt; 38 Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn A 1</pre>	Ala Ser Ala Asn Ser 15
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn A  1 5 10  Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr C	I5 Glu Ile Ser Lys Lys
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn A  1 5 10  Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr G  20 25  Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val I	IS Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn A  1 5 10  Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr G  20 25  Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val I  35 40  Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys A	IS Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn And Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Grant Ser Asn Ala Val Val Leu Ala Val Val Leu Ala Val In Ser Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys And Ser Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser In Ser	IS  ILLU THE SET LYS LYS  30  LYS Glu Val Glu Thr  45  Ala Ile Gly Lys Lys  50  Lys Asn Thr Ser Leu
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Asn 1       5       10       10         Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ser Asn Ala Val Val Leu Ala Val I 35       25         Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val I 35       40         Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys A 50       55         Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser I 65       70         Leu Ser Gly Ala Tyr Ala Ile Ser Asp Leu Ile A 50	IS Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn And Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Grant Ser Asn Ala Val Val Leu Ala Val I Ser Asn Ala Val Val Leu Ala Val I Ser I Ser Asn Asn Gly Leu Glu Ala Asn Gln Ser I Ser Asp Leu Ser Gly Ala Tyr Ala I Ser Asp Leu I Ser Asp Leu I Ser Asp Clu Leu Lys Glu Lys I Ser Asp Clu Leu Ala I Ser I Ser Asp Leu I Ser Asp Clu Leu Lys Glu Leu I Ser Asp Leu I Ser Asp Clu Leu Lys Glu Lys I Ser Asp Leu I Ser Asp Leu I Ser Asp Clu Lys Clu Lys I Ser Asp Clu Lys Clu Lys I Ser Asp Clu Lys Clu	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn And Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Grant G	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln 110 Glu His Ala Val Leu
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn And Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Grant G	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 60 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln 110 Glu His Ala Val Leu 125 Arg Ala Ile Leu Lys
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn And Asn Ser Gly Lys Asp Gly Asn And Asn Ser Gly Bro Asn Leu Thr Gly Ser Asn Ala Val Val Leu Ala Val Ingress Asn Ala Val Val Leu Ala Val Ingress Asn Asn Gly Leu Glu Leu Ala Thr Lys And Asn Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Ingress Asn Gly Ala Ingress Asn Gly Ala Ingress Asn Ala Ingress Asn Gly Ala Ingress Asn Asn Gly Leu Lys Glu Lys Ingress Asn Gly Glu Leu Lys Glu Lys Ingress Asn Ala Glu Gly Leu Asn Asn Asn Asn Gly Ingress Asn Ala Gly Ingress Asn Asn Asn Asn Asn Asn Asn Ingress Asn Asn Asn Asn Asn Asn Asn Ingress Asn Asn Asn Asn Asn Ingress Asn Asn Asn Asn Ingress Asn Ingress Asn Asn Asn Ingress	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln 110 Glu His Ala Val Leu 125 Arg Ala Ile Leu Lys 140 Leu Glu Lys Leu Phe
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Asn Ser Gly Lys Asp Gly Asn Asn Ser Gly Lys Asp Gly Asn Asn I to Ser Asp Gly Ser Asn Ala Val Val Leu Ala Val I asp Gly Asn Asn Gly Leu Ala Thr Lys Asp Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser I for Ser Gly Ala Tyr Ala I for Ser Asp Leu I for Ser Gly Ala Tyr Ala I for Ser Asp Leu I for Asp Gly Leu Lys Glu Lys I for Asn I for Ser I for Asn I for Ser I for Asn I for I for I for Asn I for	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln 110 Glu His Ala Val Leu 125 Arg Ala Ile Leu Lys 140 Leu Glu Lys Leu Phe 160 Asp Thr Leu Lys Asn
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Asn Ser Gly Lys Asp Gly Asn Asn Ser Gly Asn Asn Ser Gly Asn Asn In	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln 110 Glu His Ala Val Leu 125 Arg Ala Ile Leu Lys 140 Leu Glu Lys Leu Phe 160 Asp Thr Leu Lys Asn 175 Gly Asn Asn Ser Arg
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Ala Ala Gln Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ser Asn Ala Val Val Leu Ala Val I 35       25         Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val I 35       40         Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Asp Son	Glu Ile Ser Lys Lys 30 Lys Glu Val Glu Thr 45 Ala Ile Gly Lys Lys 50 Lys Asn Thr Ser Leu 80 Ala Glu Lys Leu Asn 95 Asp Thr Ala Lys Gln 110 Glu His Ala Val Leu 125 Arg Ala Ile Leu Lys 140 Leu Glu Lys Leu Phe 160 Asp Thr Leu Lys Asn 175 Gly Asn Asn Ser Arg 190

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Pro Asn Leu	Thr Glu			Lys	Lys	Ile	Thr	Glu 220	Ser	Asn	Ala	Val	
210 Val Leu Ala	Val Lys	Glu '	215 Val	Glu	Thr	Leu	Leu 235		Ser	Ile	Asp	Glu 240	
225 Leu Ala Thr			Gly	Lys	Lys	Ile		Asn	Asn	Gly	Leu 255		
Ala Asn Gln		Asn '	Thr	Ser		250 Leu	Ser	Gly	Ala	Tyr 270		Ile	
Ser Asp Leu 275		Glu :	Lys			Val	Leu	Lys	Asn 285		Glu	Leu	
Lys Glu Lys 290	Ile Asp	Thr .			Gln	Cys	Ser	Thr 300	Glu	Phe	Thr	Asn	
Lys Leu Lys	Ser Glu			Val	Leu	Gly	Leu 315	Asp	Asn	Leu	Thr	Asp 320	
Asp Asn Ala	Gln Arg	Ala	Ile	Leu	Lys	Lys 330	His	Ala	Asn	Lys	Asp 335	Lys	
Gly Ala Ala	Glu Leu	Glu	Lys	Leu	Phe 345		Ala	Val	Glu	Asn 350	Leu	Ser	
Lys Ala Ala 355	Gln Asp	Thr	Leu	Lys 360		Ala	Val	Lys	Glu 365		Thr	Ser	
<210> 39 <211> 1107 <212> DNA <213> Artif <220> <223> OspC		equenc	:e										
<221> CDS <222> (1)	. (1107)												
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gct gat gag Ala Asp Glu	tct gtt Ser Val	aaa l Lys	gly	cct Pro	aat Asn 25	ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 30	aaa Lys	aaa Lys	96
att aca gaa Ile Thr Glu 3!	Ser Ası	c gca n Ala	gtt Val	gtt Val 40	ctg Leu	gcc Ala	gtg Val	aaa Lys	gaa Glu 45	gtt Val	gag Glu	acc Thr	144
tta ctt gc Leu Leu Ala 50	tct ata Ser Ile	a gat, e Asp	gaa Glu 55	ctt Leu	gct Ala	acc Thr	aaa Lys	gct Ala 60	att Ile	ggt Gly	aaa Lys	aaa Lys	192
ata ggc aa	aat gg	t tta	gag	gcc	aat	cag	agt Ser	aaa Lvs	aac Asn	aca Thr	tca Ser	ttg Leu	240
Ile Gly As:	n Asn Gl	y Leu 70	Glu	Ala	ASII	Gin	75	_, _		1111	DCI	80	

An.t

gta Val	ttg Leu	aaa Lys	aat Asn 100	gaa Glu	gaa Glu	tta Leu	aag Lys	gaa Glu 105	aag Lys	att Ile	gat Asp	aca Thr	gct Ala 110	aag Lys	caa Gln	336
tgt Cys	tct Ser	aca Thr 115	gaa Glu	ttt Phe	act Thr	aat Asn	aaa Lys 120	cta Leu	aaa Lys	agt Ser	gaa Glu	cat His 125	gca Ala	gtg Val	ctt Leu	384
ggt Gly	ctg Leu 130	gac Asp	aat Asn	ctt Leu	act Thr	gat Asp 135	gat Asp	aat Asn	gca Ala	caa Gln	aga Arg 140	gct Ala	att Ile	tta Leu	aaa Lys	432
aaa Lys 145	cat His	gca Ala	aat Asn	aaa Lys	gat Asp 150	aag Lys	ggt Gly	gct Ala	gca Ala	gaa Glu 155	ctt Leu	gaa Glu	aag Lys	tta Leu	ttt Phe 160	480
aaa Lys	gcg Ala	gta Val	gaa Glu	aac Asn 165	tta Leu	tca Ser	aaa Lys	gca Ala	gct Ala 170	caa Gln	gac Asp	aca Thr	tta Leu	aaa Lys 175	aat Asn	528
gct Ala	gtt Val	aaa Lys	gag Glu 180	ctt Leu	aca Thr	agt Ser	cct Pro	att Ile 185	gtc Val	cat His	ggt Gly	aat Asn	aat Asn 190	tca Ser	Gly aaa	576
aaa Lys	gat Asp	999 Gly 195	aat Asn	aca Thr	tct Ser	gca Ala	aat Asn 200	tct Ser	gct Ala	gat Asp	gag Glu	tct Ser 205	gtt Val	aaa Lys	Gl <sup>A</sup> aaa	624
cct Pro	aat Asn 210	ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 215	aaa Lys	aaa Lys	att Ile	aca Thr	gaa Glu 220	tct Ser	aac Asn	gca Ala	gtt Val	672
gtt Val 225	ctc Leu	gcc Ala	gtg Val	aaa Lys	gaa Glu 230	gtt Val	gaa Glu	act Thr	ttg Leu	ctt Leu 235	aca Thr	tct Ser	ata Ile	gat Asp	gag Glu 240	720
ctt Leu	gct Ala	aaa Lys	gct Ala	att Ile 245	ggt Gly	aaa Lys	aaa Lys	ata Ile	aaa Lys 250	aac Asn	gat Asp	gtt Val	agt Ser	tta Leu 255	gat Asp	768
aat Asn	gag Glu	gca Ala	gat Asp 260	cac His	aac Asn	gga Gly	tca Ser	tta Leu 265	ata Ile	tca Ser	gga Gly	gca Ala	tat Tyr 270	tta Leu	att Ile	816
tca Ser	aac Asn	tta Leu 275	ata Ile	aca Thr	aaa Lys	aaa Lys	ata Ile 280	agt Ser	gca Ala	ata Ile	aaa Lys	gat Asp 285	tca Ser	gga Gly	gaa Glu	864
ttg Leu	aag Lys 290	gca Ala	gaa Glu	att Ile	gaa Glu	aag Lys 295	gct Ala	aag Lys	aaa Lys	tgt Cys	tct Ser 300	gaa Glu	gaa Glu	ttt Phe	act Thr	912
gct Ala 305	aaa Lys	tta Leu	aaa Lys	ggt Gly	gaa Glu 310	cac His	aca Thr	gat Asp	ctt Leu	ggt Gly 315	aaa Lys	gaa Glu	ggc Gly	gtt Val	act Thr 320	960
gat Asp	gat Asp	aat Asn	gca Ala	aaa Lys 325	aaa Lys	gcc Ala	att Ile	tta Leu	aaa Lys 330	aca Thr	aat Asn	aat Asn	gat Asp	aaa Lys 335	act Thr	1008

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aag (	ggc g	la P	gat g Asp C	gaa c Blu I	tt (	gaa a Glu l	Lys :	tta Leu 345	ttt Phe	gaa Glu	tca Ser		aaa Lys 350	aac ( Asn ]	tg Leu	1056
tca a	Lys P	gca g Ala A 855	gct a Ala I	aaa g Lys C	gag ( Glu	met.	ctt Leu 360	act Thr	aat Asn	tca Ser	gtt Val	aaa Lys 365	gag Glu	ctt Leu	aca Thr	1104
																1107
agc Ser																
<211 <212	> 40 > 36 > PR > Ar	Γ	cial	Seq	uenc	e e										
<220 <223	)>  > Os	pC C	hime	ra												
Met		Cys												Asn 15		
1 Ala	Asp	Glu	Ser	Val	Lys	Gly	Pro	Asn	Leu	Thr	Glu	Ile	Ser	Lys	Lys	
Ile	Thr	Glu	20 Ser	Asn	Ala	Val	Val	25 Leu	Ala	Val	Lys	Glu 45	Val	Glu	Thr	
Leu	Leu	35 Ala	Ser	Ile	Asp	Glu	Leu	Ala	Thr	Lys	Ala 60	Ile	Gly	Lys	Lys	
					70					/ 3	Lys			Ser		
					Ala									Leu 95		
			100					1 117								
			Glu											Val		
							Asp	Asn						e Leu		
Lys	His	Ala	Asn	Lys	Asp	Lys	Gly	Ala	a Ala	a Glu 155	Leu S	Glu	ı Lys	Leu	Phe 160	
145 Lys	Ala	Val	Glu	Asn	150 Leu	Ser	Lys	Ala	a Ala 170	a Glr	a Asp	Thi	Let	ı Lys 175	Asn	
									e Vai	l His					Gly	
		400	Asn	Thr			2111	sei	c Ala			20.	,		Gly	
			Thr				- Гуз	s Ly:						n Ala		
Val	210 Leu	Ala	Val	Lys	Glu	ı Val	. Glı	ı Th	r Le	u Lei	u Thi	s Se	r Il	e Asp	Glu 240	
					227	`			е Lу	s As:	_				ı Asp	
				2/15				r Le	u Il	U				r Lei	l Ile	
			260 11e	١				26 e Se	2				p Se	•	y Glu	

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Leu Lys Ala Glu Ile Glu Lys Ala Lys Lys Cys Ser Glu Glu Phe Thr 295 Ala Lys Leu Lys Gly Glu His Thr Asp Leu Gly Lys Glu Gly Val Thr 315 310 Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr Asn Asn Asp Lys Thr 330 325 Lys Gly Ala Asp Glu Leu Glu Lys Leu Phe Glu Ser Val Lys Asn Leu 350 345 Ser Lys Ala Ala Lys Glu Met Leu Thr Asn Ser Val Lys Glu Leu Thr 360 Ser <210> 41 <211> 1106 <212> DNA <213> Artificial Sequence <220> <223> OspC Chimera <221> CDS <222> (1)...(1106) atg gct tgt aat aat tca gga aaa gat ggg aat gca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Ala Ser Ala Asn Ser gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 20 att aca gaa tot aac goa gtt gtt otg goo gtg aaa gaa gtt gag acc 144 Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu Thr 35 tta ctt gca tct ata gat gaa ctt gct acc aaa gct att ggt aaa aaa Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys 50 ata ggc aat aat ggt tta gag gcc aat cag agt aaa aac aca tca ttg 240 Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser Leu 65 tta tca gga gct tat gca ata tct gac cta ata gca gaa aaa tta aat 288 Leu Ser Gly Ala Tyr Ala Ile Ser Asp Leu Ile Ala Glu Lys Leu Asn 85 gta ttg aaa aat gaa gaa tta aag gaa aag att gat aca gct aag caa 336 Val Leu Lys Asn Glu Glu Leu Lys Glu Lys Ile Asp Thr Ala Lys Gln 100 tgt tct aca gaa ttt act aat aaa cta aaa agt gaa cat gca gtg ctt 384 Cys Ser Thr Glu Phe Thr Asn Lys Leu Lys Ser Glu His Ala Val Leu 115

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Gly	Leu 130	Asp	Asn	ctt Leu	Thr	135	Asp	Wali	AIG	<b>011</b>	140				-	432
Lys 145	His	Ala	Asn	aaa Lys	150	гуѕ	GIY	ΑΙα	ліа	155			2		160	480
aaa Lys	gcg Ala	gta Val	gaa Glu	aac Asn 165	tta Leu	tca Ser	aaa Lys	gca Ala	gct Ala 170	caa Gln	gac Asp	aca Thr	tta Leu	aaa Lys 175	aat Asn	528
gct Ala	gtt Val	aaa Lys	gag Glu 180	ctt Leu	aca Thr	agt Ser	cct Pro	att Ile 185	gtc Val	cat His	ggt Gly	aat Asn	aat Asn 190	tca Ser	gga Gly	576
aaa Lys	gat Asp	999 Gly 195	Asn	aca Thr	tct Ser	gca Ala	aat Asn 200	tct Ser	gct Ala	gat Asp	gag Glu	tct Ser 205	gtt Val	aaa Lys	gly aaa	624
cct Pro	aat Asn 210	ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 215	aaa Lys	aaa Lys	att Ile	aca Thr	gaa Glu 220	001	aac Asn	gca Ala	gtt Val	672
gtt Val 225	Leu	gct Ala	gtg Val	aaa Lys	gaa Glu 230	тте	gaa Glu	act Thr	ttg Leu	ctt Leu 235		tct Ser	ata Ile	gat Asp	gaa Glu 240	720
ctt Leu	gct Ala	act Thi	aaa Lys	gct Ala 245	. IIe	ggt Gly	aaa Lys	aaa Lys	ata Ile 250	GII	caa Gln	aat Asn	ggt Gly	ggt Gly 255	tta Leu	768
gct Ala	gto Val	gaa Glu	a gcg ı Ala 260	a Gly	g cat His	aat Asn	gga Gly	aca Thr 265	пеп	tta Lev	a gca a Ala	ggt Gly	gct Ala 270	- 2	aca Thr	816
ata Ile	a tca e Sei	a aaa Lya 27!	s Le	a ata ı Ile	a aca e Thi	caa Glr	aaa Lys 280	, цес	gat Asp	gga Gly	a ttg / Lei	g aaa 1 Lys 285	,	tca Ser	gaa Glu	864
aaa Lys	a tta s Lei 290	ı Ly	g ga s Gl	a aaa u Lys	a att	gaa Glu 295	ı Asr	gct Ala	a ag	э шу:	a tgt s Cys 300	5 001	gaa Glu	a gat 1 Asp	ttt Phe	912
ac Th	r Ly	a aa s Ly	a ct s Le	a gaa u Gl	a gga u Gly 31	A GT	a cat ı His	gcg a Ala	g caa a Gli	a cti n Lei 31	u Or	a att y Ile	gaa e Glu	a aat ı Ası	gtt n Val 320	960
ac Th	t ga r As	t ga p Gl	g aa u As	t gc n Al 32	а Lу	a aaa s Ly	a gci s Ala	t att	t tta e Le	u 11	a ac e Th	a gat r Asj	t gca p Ala	a gct a Ala 33!	t aaa a Lys 5	1008
ga As	t aa p Ly	g gg s Gl	jc gc y Al 34	a Al	a ga a Gl	g ct u Le	t ga u Gl	a aa u Ly 34	S LE	a tt u Ph	t aa e Ly	a gc s Al	a gta a Va 35		a aac u Asn	1056
tt Le	g go u Al	a aa a Ly 35	/s Al	a go a Al	t aa a Ly	a ga s Gl	g at u Me 36	с ье	t gc u Al	t aa a As	it to in Se	a gt r Va 36	1	a ga s Gl	g ctt u Leu	1104

Al Con. t

ac <210> 42 <211> 368 <212> PRT <213> Artificial Sequence <220> <223> OspC Chimera Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Ala Ser Ala Asn Ser <400> 42 10 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 25 Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu Thr 40 Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys 55 Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser Leu 75 70 Leu Ser Gly Ala Tyr Ala Ile Ser Asp Leu Ile Ala Glu Lys Leu Asn 90 85 Val Leu Lys Asn Glu Glu Leu Lys Glu Lys Ile Asp Thr Ala Lys Gln 105 Cys Ser Thr Glu Phe Thr Asn Lys Leu Lys Ser Glu His Ala Val Leu 125 120 Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Gln Arg Ala Ile Leu Lys 140 135 Lys His Ala Asn Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe 155 150 Lys Ala Val Glu Asn Leu Ser Lys Ala Ala Gln Asp Thr Leu Lys Asn 170 165 Ala Val Lys Glu Leu Thr Ser Pro Ile Val His Gly Asn Asn Ser Gly 185 Lys Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly 180 205 200 195 Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn Ala Val 220 215 Val Leu Ala Val Lys Glu Ile Glu Thr Leu Leu Ala Ser Ile Asp Glu 235 230 Leu Ala Thr Lys Ala Ile Gly Lys Lys Ile Gln Gln Asn Gly Gly Leu 250 Ala Val Glu Ala Gly His Asn Gly Thr Leu Leu Ala Gly Ala Tyr Thr 245 265 Ile Ser Lys Leu Ile Thr Gln Lys Leu Asp Gly Leu Lys Asn Ser Glu 260 285 280 Lys Leu Lys Glu Lys Ile Glu Asn Ala Lys Lys Cys Ser Glu Asp Phe 275 300 295 Thr Lys Lys Leu Glu Gly Glu His Ala Gln Leu Gly Ile Glu Asn Val 315 310 Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala Lys 330 Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val Glu Asn 350 345 Leu Ala Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu 360

Al.t

	<210> 4 <211> 6 <212> I <213> F	33 AMC	elia	ı buı	rgdo	rfer	·i												
	<220> <221> ( <222>	CDS (1).	(6	533)															
	<400> atg aa Met Ly 1	43 a aa s Ly	ıg aa rs As	sn 1	ca t hr I 5	ta a Leu S	agt Ser	gcg Ala	at Il	a t e L	ta a Leu N	atg Met	act Thr	tta Leu	ttt Phe	tt Le 1	atu P	tt	48
	ata to Ile Se	t to	/S A	at a sn A 20	at i	tca ( Ser	gly ggg	aaa Lys		t g p 6	gly .	aat Asn	aca Thr	tct Ser	gca Ala 30	aa As	t t n S	ct Ser	96
۱۱ یا	gct ga Ala As	sp G	ag t lu S 35	ct s	gtt /al	aaa Lys	Gly ggg	cct Pro 40	aa As	at o	ctt Leu	aca Thr	gaa Glu	ata Ile 45	aat Asr	aa Ly	a a rs 1	aaa Lys	144
m.t	att ad Ile Ti			ct a Ser 1	aat Asn	gcg Ala	gtt Val 55	tta Leu	ct Le	eu i	gct Ala	gtg Val	aaa Lys 60	gag Glu	gt! Va:	z ga l Gi	aa ( Lu	gcg Ala	192
	ttg c Leu L		ca ter s	ct Ser	ata Ile	gat Asp 70	gaa Glu	att Ile	g A	ct la	gct Ala	aaa Lys 75	gct Ala	att Ile	g1	t as y L	aa ys	aaa Lys 80	240
	65 ata c Ile H	ac c	aa a Sln	aat Asn	aat Asn 85		ttg Leu	gat Asp	a T	cc hr	gaa Glu 90	aat Asr	aat Asr	cac His	aa As	t g n G	ga ly 95	tca Ser	288
	ttg t Leu I	ta g Leu A	Ala	gga Gly 100		tat Tyr	gca Ala	a ata		ca Ser	acc Thr	cta Lev	ata 1 Ile	a aaa e Lys	a ca s Gl	a a n I	aa ys	tta Leu	336
	gat g	3ly			aat Asn	gaa Glu	gga Gl	a tt y Le 12	u -	aag Lys	gaa Glu	aaa Ly	a at	t gat e As <sub>]</sub> 12	t go p Al	eg g la <i>F</i>	jct Ala	aag Lys	384
	aaa t			gaa Glu	aca Thr	ttt Phe	ac Th	L AD	t a	aaa Lys	tta Leu	a aa 1 Ly	a ga s Gl 14	a aa u Ly 0	a ca s H	ac a	aca Thr	gat Asp	432
			aaa Lys	gaa Glu	ggt Gly	gtt Val	T 111	t ga r As	it (	gct Ala	gat Asj	t gc p Al 15	a aa a Ly 5	a ga 's Gl	ag uA	cc la	att Ile	tta Leu 160	480
		gca Ala	aat Asn	ggt Gly	act Th:	rьy	a ac s Th	t aa ir Ly	aa /S	ggt Gly	gc Al		ia ga .u Gl	ia ct lu Le	t g eu G	ga lly	aaa Lys 175	tta Leu	528
	ttt Phe	gaa Glu	tca Ser	gta Val	ı ga L Gl		c tt 1 Le	g to eu S	ca er	aaa Lys 18		a go a A	ct ac	aa ga ys Gi	ag a lu N	itg Met 190	ctt Lei	gct Ala	576

Al Cro. t

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aat tca gtt aaa gag ctt aca agc cct gtt gtg gca gaa agt cca aaa Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val Ala Glu Ser Pro Lys 200 195 633 aaa cct taa Lys Pro \* 210 <210> 44 <211> 210 <212> PRT <213> Borrelia burgdorferi Met Lys Lys Asn Thr Leu Ser Ala Ile Leu Met Thr Leu Phe Leu Phe Ile Ser Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 25 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Asn Lys Lys 40 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 55 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys 75 70 Ile His Gln Asn Asn Gly Leu Asp Thr Glu Asn Asn His Asn Gly Ser 90 Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr Leu Ile Lys Gln Lys Leu 105 Asp Gly Leu Lys Asn Glu Gly Leu Lys Glu Lys Ile Asp Ala Ala Lys 120 Lys Cys Ser Glu Thr Phe Thr Asn Lys Leu Lys Glu Lys His Thr Asp 140 135 Leu Gly Lys Glu Gly Val Thr Asp Ala Asp Ala Lys Glu Ala Ile Leu 155 Lys Ala Asn Gly Thr Lys Thr Lys Gly Ala Glu Glu Leu Gly Lys Leu 150 170 Phe Glu Ser Val Glu Val Leu Ser Lys Ala Ala Lys Glu Met Leu Ala 165 185 Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val Ala Glu Ser Pro Lys 180 200 Lys Pro 210 <210> 45 <211> 580 <212> DNA <213> Borrelia burgdorferi <220> <221> CDS <222> (1) ... (580) atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 10

#### 91 47/102

gct Ala	gat Asp	gag Glu	tct Ser 20	gtt Val	aaa Lys	ggg Gly	cct Pro	aat Asn 25	ctt Leu	aca Thr	gaa Glu	ata Ile	aat Asn 30	aaa Lys	aaa Lys	96
att Ile	acg Thr	gat Asp 35	tct Ser	aat Asn	gcg Ala	gtt Val	tta Leu 40	ctt Leu	gct Ala	gtg Val	aaa Lys	gag Glu 45	gtt Val	gaa Glu	gcg Ala	144
ttg Leu	ctg Leu 50	tca Ser	tct Ser	ata Ile	gat Asp	gaa Glu 55	att Ile	gct Ala	gct Ala	aaa Lys	gct Ala 60	att Ile	ggt Gly	aaa Lys	aaa Lys	192
ata Ile 65	cac His	caa Gln	aat Asn	aat Asn	ggt Gly 70	ttg Leu	gat Asp	acc Thr	gaa Glu	aat Asn 75	aat Asn	cac His	aat Asn	gga Gly	tca Ser 80	240
ttg Leu	tta Leu	gcg Ala	gga Gly	gct Ala 85	tat Tyr	gca Ala	ata Ile	tca Ser	acc Thr 90	cta Leu	ata Ile	aaa Lys	caa Gln	aaa Lys 95	tta Leu	288
gat Asp	gga Gly	ttg Leu	aaa Lys 100	Asn	gaa Glu	gga Gly	tta Leu	aag Lys 105	gaa Glu	aaa Lys	att Ile	gat Asp	gcg Ala 110	gct Ala	aag Lys	336
aaa Lys	tgt Cys	tct Ser	Glu	aca Thr	ttt Phe	act Thr	aat Asn 120	. цуъ	tta Leu	aaa Lys	gaa Glu	aaa Lys 125		aca Thr	gat Asp	384
ctt Lei	ggt Gly	/ Lys	gaa Glu	ggt Gly	gtt Val	act Thr 135	Asp	gct Ala	gat Asp	gca Ala	aaa Lys 140		gco Ala	att Ile	tta Leu	432
aaa Lys 14!	s Ala	a aat a Ası	ggt Gly	act Thr	aaa Lys	Thr	aaa Lys	ggt Gly	gct Ala	gaa Glu 155		a ctt 1 Lei	gga Gly	a aaa / Ly:	tta Leu 160	480
tt! Ph	t gaa e Gli	a tca u Sei	a gta r Va	a gag l Glu 169	ı va.	tto L Lei	g tca ı Sei	a aaa c Lys	a gca s Ala 170		a aaa a Lys	a gaq s Glu	g ato 1 Me	g ct Le 17	t gct u Ala 5	528
aa As	t tc n Se	a gt r Va	t aa l Ly: 18	s Gl	g cti 1 Lei	aca ı Thi	a ago r Se:	c cct r Pro 18	o va	t gtg l Va	g gca	a gaa a Gl	a ag u Se 19		a tcc o Ser	576
at Me	g g t															580
<2	10>	193									1				,	
<2 <2	12> 213>	Borr	elia	bur	gdor	feri										
Me		la Cy														
A	la As	sp G	lu Se 20	er Va	l Ly	s Gl	y Pr	o As	n Le	eu Th	ır Gl	lu I]	le As 30	sn Ly )	ys Lys	\$
														-		

Al cm:t

116 1111 6	sp Se	r Asn	Ala	Val	Leu	Leu	Ala	Val	Lys	Glu	Val	Glu	Ala	
					4()				Ala	マン				
50 Ile His C				55					00				Ser	
65 Leu Leu A			70					/ >					-	
Asp Gly I		0 5					90							
Lys Cys S	1 0	Λ				105					110			
	115				120					123				
120				175					140					
Lys Ala i			150					TOO					-00	
Phe Glu		165					170					1/5		
Asn Ser	Val Ly 18		Leu	Thr	Ser	Pro 185	Val	Val	Ala	Glu	Ser 190	Pro	ser	
Met	10	, 0												
<210> 47														
<211> 63 <212> DN	Ά													
<213> Bo	rrelia	a gari	.nii											
<220>	s													
<220> <221> CD <222> (1		639)												
<221> CD <222> (1 <400> 47	.) (	at ac	a tta	agt	aca	ata	tta	atq	act	. tta	. ttt	. tta	ttt	48
<221> CD <222> (1 <400> 47 atg aaa Met Lys	.) (	at aca sn Thi	a tta Leu	agt Ser	gcg Ala	ata Ile	ьeu	. Met	act Thr	tta Leu	ttt Phe			48
<221> CD <222> (1 <400> 47 atg aaa Met Lys 1	aag a Lys A	at aca sn Thi	. Leu	Ser	Ala	11e	10	Mec	. 1111	пес	riic	15		
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<221> CD <222> (1 <400> 47 atg aaa Met Lys 1 ata tct Ile Ser  cct gct Pro Ala  aaa att Lys Ile 50	aag a Lys A tgt a Cys S gac g Asp G 35 aca g	at acass Thin 5 gt aat er Ass 20 ag to lu Se: at to sp Se	t tcan Ser Ala	ggg Gly aaa Lys gca Ala	aaaa Lys Gly 40	ggt Gly 25 cct Pro	ggg Gly aat Asr	gat Asp ctt Leu gct	tct Ser aca Thr gtt Val	gca gca gaa Glu 45 aaa Lys	tct Ser 30 a ata i Ile i a gaa	15 act Thr agg	aat Asn aaa Lys gag Glu	96 144 192 240
<221> CD <222> (1 <400> 47 atg aaa Met Lys 1 ata tct Ile Ser cct gct Pro Ala aaa att Lys Ile	aag a Lys A tgt a Cys S gac g Asp G 35 aca g	at acass Thin 5 gt aat er Ass 20 ag to lu Se: at to sp Se	t tcan Ser Ala	ggg Gly aaaa Lys gca Ala 55	aaaa Lys Gly 40	ggt Gly 25 cct Pro	ggg Gly aat Asr	gat Asp ctt Leu gct	tct Ser aca Thi tgtt a Vai 60	gca gca gaa Glu 45 aaa Lys	tct Ser 30 a ata i Ile i a gaa	15 act Thr agg	aat Asn aaa Lys gag Glu	96 144 192 240
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A1 cm.t

### 93 <del>49/10</del>2

tcg ttg Ser Leu	tta Leu	gca Ala 100	gga Gly	gcc Ala	tat Tyr	gca Ala	ata Ile 105	tca Ser	acc Thr	cta Leu	ata Ile	aca Thr 110	gaa Glu	aaa Lys	. 336
ttg agt Leu Ser	aaa Lys 115	ttg Leu	aaa Lys	aat Asn	tta Leu	gaa Glu 120	gaa Glu	tta Leu	aag Lys	aca Thr	gaa Glu 125	att Ile	gca Ala	aag Lys	384
gct aag Ala Lys 130	Lys	tgt Cys	tcc Ser	gaa Glu	gaa Glu 135	ttt Phe	act Thr	aat Asn	aaa Lys	cta Leu 140	aaa Lys	agt Ser	ggt Gly	cat His	432
gca gat Ala Asp 145	ctt Leu	ggc Gly	aaa Lys	cag Gln 150	gat Asp	gct Ala	acc Thr	gat Asp	gat Asp 155	cat His	gca Ala	aaa Lys	gca Ala	gct Ala 160	480
att tta Ile Leu	aaa Lys	aca Thr	cat His 165	gca Ala	act Thr	acc Thr	gat Asp	aaa Lys 170	ggt Gly	gct Ala	aaa Lys	gaa Glu	ttt Phe 175	aaa Lys	528
gat tta Asp Leu	ttt Phe	gaa Glu 180	tca Ser	gta Val	gaa Glu	ggt Gly	ttg Leu 185	tta Leu	aaa Lys	gca Ala	gct Ala	caa Gln 190	gta Val	gca Ala	576
cta act Leu Thr	aat Asn 195	tca Ser	gtt Val	aaa Lys	gaa Glu	ctt Leu 200	aca Thr	agt Ser	cct Pro	gtt Val	gta Val 205	gca Ala	gaa Glu	agt Ser	624
cca aaa Pro Lys 210	Lys														639
<210> 4 <211> 2 <212> I <213> I	212 PRT	lia	gari	nii											
<400> 4	18 S Lys	Asn	Thr	Leu	Ser	Ala	Ile	Leu	Met	Thr	Leu	Phe	Leu	Phe	
1 Ile Se			5					10					15		
			ADII	SCI	Ory	гув	Gly	Gly	Asp	Ser	Ala	Ser	Thr	Asn	
Pro Ala		20				Gly	25				Glu	30			
Lys Ile	3.5	20 Glu	Ser	Ala	Lys Ala	Gly 40	25 Pro	Asn	Leu	Thr	Glu 45	Ile	Ser	Lys	
Lys Ile 50 Thr Le	35 E Thr u Val	20 Glu Asp Leu	Ser Ser Ser	Ala Asn Ile 70	Lys Ala 55 Asp	Gly 40 Phe Glu	25 Pro Val Leu	Asn Leu Ala	Leu Ala Lys 75	Thr Val 60 Lys	Glu 45 Lys Ala	Ile Glu Ile	Ser Val Gly	Lys Glu Gln 80	
Lys Ile 50 Thr Les 65 Lys Ile	35 E Thr Ual E Asp	20 Glu Asp Leu Asn	Ser Ser Ser Asn	Ala Asn Ile 70 Asn	Lys Ala 55 Asp Gly	Gly 40 Phe Glu	25 Pro Val Leu Ala	Asn Leu Ala Ala 90	Leu Ala Lys 75 Leu	Thr Val 60 Lys Asn	Glu 45 Lys Ala Asn	Ile Glu Ile Gln	Ser Val Gly Asn 95	Lys Glu Gln 80 Gly	
Lys Ile 50 Thr Les 65 Lys Ile Ser Les	35 E Thr 1 Val E Asp u Leu	20 Glu Asp Leu Asn Ala	Ser Ser Ser Asn 85	Ala Asn Ile 70 Asn Ala	Lys Ala 55 Asp Gly Tyr	Gly 40 Phe Glu Leu	25 Pro Val Leu Ala Ile 105	Asn Leu Ala Ala 90 Ser	Leu Ala Lys 75 Leu Thr	Thr Val 60 Lys Asn Leu	Glu 45 Lys Ala Asn Ile	Ile Glu Ile Gln Thr	Ser Val Gly Asn 95 Glu	Lys Glu Gln 80 Gly Lys	
Lys Ile 50 Thr Ler 65 Lys Ile Ser Ler Leu Se	35 E Thr I Val E Asp I Leu T Lys 115	20 Glu Asp Leu Asn Ala 100 Leu	Ser Ser Ser Asn 85 Gly	Ala Asn Ile 70 Asn Ala Asn	Lys Ala 55 Asp Gly Tyr	Gly 40 Phe Glu Leu Ala Glu 120	25 Pro Val Leu Ala Ile 105 Glu	Asn Leu Ala Ala 90 Ser Leu	Leu Ala Lys 75 Leu Thr	Thr Val 60 Lys Asn Leu Thr	Glu 45 Lys Ala Asn Ile Glu 125	Ile Glu Ile Gln Thr 110 Ile	Ser Val Gly Asn 95 Glu Ala	Lys Glu Gln 80 Gly Lys	
Lys Ile 50 Thr Les 65 Lys Ile Ser Les	35 Part Thr Val Part Asp Leu Leu Lys 115 S Lys	20 Glu Asp Leu Asn Ala 100 Leu	Ser Ser Ser Asn 85 Gly Lys	Ala Asn Ile 70 Asn Ala Asn Glu	Lys Ala 55 Asp Gly Tyr Leu Glu 135	Gly 40 Phe Glu Leu Ala Glu 120 Phe	Pro Val Leu Ala Ile 105 Glu Thr	Asn Leu Ala Ala 90 Ser Leu Asn	Leu Ala Lys 75 Leu Thr Lys	Thr Val 60 Lys Asn Leu Thr Leu 140	Glu 45 Lys Ala Asn Ile Glu 125 Lys	Glu Ile Gln Thr 110 Ile Ser	Ser Val Gly Asn 95 Glu Ala Gly	Lys Glu Gln 80 Gly Lys Lys His	

Cw.

Ile Leu Lys Thr His Ala Thr Thr Asp Lys Gly Ala Lys Glu Phe Lys 170 165 Asp Leu Phe Glu Ser Val Glu Gly Leu Leu Lys Ala Ala Gln Val Ala 185 180 Leu Thr Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val Ala Glu Ser 200 195 Pro Lys Lys Pro 210 <210> 49 <211> 624 <212> DNA <213> Borrelia afzelii <220> <221> CDS <222> (1)...(624) <400> 49 atg aaa aag aat aca tta agt gcg ata tta atg act tta ttt tta ttt Met Lys Lys Asn Thr Leu Ser Ala Ile Leu Met Thr Leu Phe Leu Phe ata tot tgt aat aat toa ggt ggg gat tot goa tot act aat oot gat 96 Ile Ser Cys Asn Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp gag tot goa aaa gga oot aat ott acc gta ata ago aaa aat aca 144 Glu Ser Ala Lys Gly Pro Asn Leu Thr Val Ile Ser Lys Lys Ile Thr gat tot aat goa tit tia otg got gig aaa gaa git gag got tig ott 192 Asp Ser Asn Ala Phe Leu Leu Ala Val Lys Glu Val Glu Ala Leu Leu tca tct ata gat gaa ctt tct aaa gct att ggt aaa aaa ata aaa aat 240 Ser Ser Ile Asp Glu Leu Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn 75 65 gat ggt act tta gat aac gaa gca aat cga aac gaa tca ttg ata gca 288 Asp Gly Thr Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala 90 85 gga gct tat gaa ata tca aaa cta ata aca caa aaa tta agt gta ttg 336 Gly Ala Tyr Glu Ile Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu 100 aat tca gaa gaa tta aag aaa aaa att aaa gag gct aag gat tgt tcc 384 Asn Ser Glu Glu Leu Lys Lys Lys Ile Lys Glu Ala Lys Asp Cys Ser caa aaa ttt act act aag cta aaa gat agt cat gca gag ctt ggt ata 432 Gln Lys Phe Thr Thr Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile 135 130 caa agc gtt cag gat gat aat gca aaa aaa gct att tta aaa aca cat 480 Gln Ser Val Gln Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His 155 150 145

#### 95 5<del>1/10</del>2

528

576

624

gga act aaa gac aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca Gly Thr Lys Asp Lys Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser 170 165 cta gaa agc ttg tca aaa gca gcg caa gca gca tta act aat tca gtt Leu Glu Ser Leu Ser Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val 185 180 aaa gag ctt aca aat cct gtt gtg gca gaa agt cca aaa aaa cct taa Lys Glu Leu Thr Asn Pro Val Val Ala Glu Ser Pro Lys Lys Pro \* 200 195 <210> 50 <211> 207 <212> PRT <213> Borrelia afzelii <400> 50 Met Lys Lys Asn Thr Leu Ser Ala Ile Leu Met Thr Leu Phe Leu Phe 5 Ile Ser Cys Asn Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp 25 20 Glu Ser Ala Lys Gly Pro Asn Leu Thr Val Ile Ser Lys Lys Ile Thr 40 Asp Ser Asn Ala Phe Leu Leu Ala Val Lys Glu Val Glu Ala Leu Leu 55 Ser Ser Ile Asp Glu Leu Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn 75 70 Asp Gly Thr Leu Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala 90 85 Gly Ala Tyr Glu Ile Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu 110 105 Asn Ser Glu Glu Leu Lys Lys Lys Ile Lys Glu Ala Lys Asp Cys Ser 125 120 115 Gln Lys Phe Thr Thr Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile 140 135 Gln Ser Val Gln Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His 150 155 Gly Thr Lys Asp Lys Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser 175 170 165 Leu Glu Ser Leu Ser Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val 190 185 180 Lys Glu Leu Thr Asn Pro Val Val Ala Glu Ser Pro Lys Lys Pro 200 195 <210> 51 <211> 1680 <212> DNA <213> ospC Chimera <220> <221> CDS <222> (1)...(1680)

<400> 51

#### 96 -52/102

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gct Ala	gat Asp	gag Glu	tct Ser 20	gtt Val	aaa Lys	Gly 999	cct Pro	aat Asn 25	ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 30	aaa Lys	aaa Lys	96
att Ile	acg Thr	gat Asp 35	tct Ser	aat Asn	gcg Ala	gtt Val	tta Leu 40	ctt Leu	gct Ala	gtg Val	aaa Lys	gag Glu 45	gtt Val	gaa Glu	gcg Ala	144
ttg Leu	ctg Leu 50	tca Ser	tct Ser	ata Ile	gat Asp	gaa Glu 55	att Ile	gct Ala	gct Ala	aaa Lys	gct Ala 60	att Ile	ggt Gly	aaa Lys	aaa Lys	192
ata Ile 65	cac His	caa Gln	aat Asn	aat Asn	ggt Gly 70	ttg Leu	gat Asp	acc Thr	gaa Glu	tat Tyr 75	aat Asn	cac His	aat Asn	gga Gly	tca Ser 80	240
ttg Leu	tta Leu	gcg Ala	gga Gly	gct Ala 85	tat Tyr	gca Ala	ata Ile	tca Ser	acc Thr 90	cta Leu	ata Ile	aaa Lys	caa Gln	aaa Lys 95	tta Leu	288
gat Asp	gga Gly	ttg Leu	aaa Lys 100	aat Asn	gaa Glu	gga Gly	tta Leu	aag Lys 105	gaa Glu	aaa Lys	att Ile	gat Asp	gcg Ala 110	gct Ala	aag Lys	336
aaa Lys	tgt Cys	tct Ser 115	gaa Glu	aca Thr	ttt Phe	act Thr	aat Asn 120	aaa Lys	tta Leu	aaa Lys	gaa Glu	aaa Lys 125	cac His	aca Thr	gat Asp	384
ctt Leu	ggt Gly 130	aaa Lys	gaa Glu	ggt Gly	gtt Val	act Thr 135	gat Asp	gct Ala	gat Asp	gca Ala	aaa Lys 140	gaa Glu	gcc Ala	att Ile	tta Leu	432
aaa Lys 145	aca Thr	aat Asn	ggt Gly	act Thr	aaa Lys 150	act Thr	aaa Lys	ggt Gly	gct Ala	gaa Glu 155	gaa Glu	ctt Leu	gga Gly	aaa Lys	tta Leu 160	480
ttt Phe	gaa Glu	tca Ser	gta Val	gag Glu 165	gtc Val	ttg Leu	tca Ser	aaa Lys	gca Ala 170	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 175	gct Ala	528
aat Asn	tca Ser	gtt Val	aaa Lys 180	Glu	ctt Leu	aca Thr	agc Ser	cct Pro 185	Val	gtg Val	gca Ala	gaa Glu	agt Ser 190	Pro	gcc Ala	576
atg Met	ggt Gly	agt Ser 195	Asn	tca Ser	ggg Gly	aaa Lys	ggt Gly 200	Gly	gat Asp	tct Ser	gca Ala	tct Ser 205	Thr	aat Asn	cct Pro	624
gct Ala	gac Asp 210	Glu	tct Ser	gcg Ala	aaa Lys	999 Gly 215	Pro	aat Asn	ctt Leu	aca Thr	gaa Glu 220	ıııe	ago Ser	aaa Lys	aaa Lys	672
att Ile 225	Thr	gat Asp	tct Ser	aat Asn	gca Ala 230	Phe	gta Val	ctt Leu	gct Ala	gtt Val 235	. Lys	gaa Glu	gtt Val	gag Glu	act Thr 240	720

er't

ttg Leu	gtt Val	tta Leu	tct Ser	ata Ile 245	gat Asp	gaa Glu	ctt Leu	gct Ala	aag Lys 250	aaa Lys	gct Ala	att Ile	ggt Gly	caa Gln 255	aaa Lys	768
ata Ile	gac Asp	aat Asn	aat Asn 260	aat Asn	ggt Gly	tta Leu	gct Ala	gct Ala 265	tta Leu	aat Asn	aat Asn	cag Gln	aat Asn 270	gga Gly	tcg Ser	816
ttg Leu	tta Leu	gca Ala 275	gga Gly	gcc Ala	tat Tyr	gca Ala	ata Ile 280	tca Ser	acc Thr	cta Leu	ata Ile	aca Thr 285	gaa Glu	aaa Lys	ttg Leu	864
agt Ser	aaa Lys 290	ttg Leu	aaa Lys	aat Asn	tta Leu	gaa Glu 295	gaa Glu	tta Leu	aag Lys	aca Thr	gaa Glu 300	att Ile	gca Ala	aag Lys	gct Ala	912
aag Lys 305	aaa Lys	tgt Cys	tcc Ser	gaa Glu	gaa Glu 310	ttt Phe	act Thr	aat Asn	aaa Lys	cta Leu 315	aaa Lys	agt Ser	ggt Gly	cat His	gca Ala 320	960
gat Asp	ctt Leu	ggc Gly	aaa Lys	cag Gln 325	gat Asp	gct Ala	acc Thr	gat Asp	gat Asp 330	cat His	gca Ala	aaa Lys	gca Ala	gct Ala 335	att Ile	1008
tta Leu	aaa Lys	aca Thr	cat His 340	gca Ala	act Thr	acc Thr	gat Asp	aaa Lys 345	ggt Gly	gct Ala	aaa Lys	gaa Glu	ttt Phe 350	aaa Lys	gat Asp	1056
tta Leu	ttt Phe	gaa Glu 355	tca Ser	gta Val	gaa Glu	ggt Gly	ttg Leu 360	tta Leu	aaa Lys	gca Ala	gct Ala	caa Gln 365	gta Val	gca Ala	cta Leu	1104
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tct Ser 385	gca Ala	tct Ser	act Thr	aat Asn	cct Pro 390	gat Asp	gag Glu	tct Ser	gca Ala	aaa Lys 395	gga Gly	cct Pro	aat Asn	ctt Leu	acc Thr 400	1200
gta Val	ata Ile	agc Ser	aaa Lys	aaa Lys 405	att Ile	aca Thr	gat Asp	tct Ser	aat Asn 410	gca Ala	ttt Phe	tta Leu	ctg Leu	gct Ala 415	gtg Val	1248
aaa Lys	gaa Glu	gtt Val	gag Glu 420	Ala	ttg Leu	ctt Leu	tca Ser	tct Ser 425	ata Ile	gat Asp	gaa Glu	ctt Leu	tct Ser 430	aaa Lys	gct Ala	1296
att Ile	ggt Gly	aaa Lys 435	Lys	ata I·le	aaa Lys	aat Asn	gat Asp 440	ggt Gly	act Thr	tta Leu	gat Asp	aac Asn 445	gaa Glu	gca Ala	aat Asn	1344
cga Arg	aac Asn 450	gaa Glu	tca Ser	ttg Leu	ata Ile	gca Ala 455	gga Gly	gct Ala	tat Tyr	gaa Glu	ata Ile 460	tca Ser	aaa Lys	cta Leu	ata Ile	1392

th t

aca Thr 465	caa Gln	aaa Lys	tta Leu	agt Ser	gta Val 470	ttg Leu	aat Asn	tca Ser	Gru	gaa Glu 475	tta Leu	aag Lys	aaa Lys	aaa Lys	att Ile 480	1440
aaa Lys	gag Glu	gct Ala	aag Lys	gat Asp 485	tgt Cys	tcc Ser	caa Gln	гÀг	ttt Phe 490	act Thr	act Thr	aag Lys	cta Leu	aaa Lys 495	gat Asp	1488
agt Ser	cat His	gca Ala	gag Glu 500	ctt Leu	ggt Gly	ata Ile	caa Gln	agc Ser 505	gtt Val	cag Gln	gat Asp	gat Asp	aat Asn 510	gca Ala	aaa Lys	1536
aaa Lys	gct Ala	att Ile 515	tta Leu	aaa Lys	aca Thr	cat His	gga Gly 520	act Thr	aaa Lys	gac Asp	aag Lys	ggt Gly 525	gct Ala	aaa Lys	gaa Glu	1584
ctt Leu	gaa Glu 530	gag Glu	tta Leu	ttt Phe	aaa Lys	tca Ser 535	cta Leu	gaa Glu	agc Ser	ttg Leu	tca Ser 540	aaa Lys	gca Ala	gcg Ala	caa Gln	1632
gca Ala 545	Ala	tta Leu	act Thr	aat Asn	tca Ser 550	gtt Val	aaa Lys	gag Glu	ctt Leu	aca Thr 555	aat Asn	cct Pro	gtt Val	gtg Val	gca Ala 560	1680
<21 <21	0 > 5 1 > 5 2 > P 3 > 0	60	Chim	era												
.40	٥. 5	2											_	_	_	
Met	Ala	Cys		5	Ser				ΤU					1.0		
Ala			20					25					30		Lys	
Ile	Thr		Ser	Asn	Ala	Val	Leu 40	Leu	Ala	_	_		TT-7	Glu	Ala	
Leu	Leu	35 Ser	_							Val	Lys	Glu 45	vaı	GIU		
			Ser	Ile	Asp	Glu	Ile				Ala	45			Lys	
	50 His				Gly	55	Ile	Ala	Ala	Lys Tyr	Ala 60	Ile	Gly	Lys		
	His	Gln	Asn	Asn Ala	Gly	55 Leu	Ile Asp	Ala Thr	Ala Glu Thr	Lys Tyr	Ala 60 Asn	Ile His	Gly Asn	Lys Gly Lys	Lys Ser	
65 Lev	His Lev	Gln Ala	Asn Gly Lys	Asn Ala 85 Asn	Gly 70 Tyr	55 Leu Ala	Ile Asp	Ala Thr Ser	Ala Glu Thr 90 Glu	Lys Tyr 75 Leu	Ala 60 Asn	Ile His	Gly Asn Gln Ala	Lys Gly Lys 95 Ala	Lys Ser 80	
65 Leu Asp	His Lev Gly	Gln Ala Leu Ser	Asn Gly Lys 100	Asn Ala 85 Asn	Gly 70 Tyr Glu	55 Leu Ala Gly	Ile Asp Ile Leu Asn	Ala Thr Ser Lys 105	Ala Glu Thr 90 Glu	Lys Tyr 75 Leu Lys	Ala 60 Asn Ile	Ile His Lys Asp	Gly Asn Gln Ala 110 His	Lys Gly Lys 95 Ala	Lys Ser 80 Leu	
65 Leu Asr Lys	His Lev Gly Cys	Gln Ala Leu Ser	Gly Lys 100	Asn Ala 85 Asn Thr	Gly 70 Tyr Glu	55 Leu Ala Gly Thr	Asp Ile Leu Asn 120	Ala Thr Ser Lys 105	Ala Glu Thr 90 Glu Leu	Lys Tyr 75 Leu Lys	Ala 60 Asn Ile Ile Glu	His Lys Asp	Gly Asn Gln Ala 110 His	Lys Gly Lys 95 Ala	S Lys Ser 80 Leu Lys	
65 Leu Asp Lys Leu	His Level Gly Cys Cys	Gln Ala Leu Ser 115	Asn Gly Lys 100 Glu	Asn Ala 85 Asr Thr	Gly 70 Tyr Glu Phe Val	55 Leu Ala Gly Thr 135 Thr	Ile Asp Ile Leu Asn 120 Asp	Ala Thr Ser Lys 105 Lys	Ala Glu Thr 90 Glu Leu Asp	Lys Tyr 75 Leu Lys Lys Ala	Ala 60 Asn Ile Ile Glu Lys 140	His Lys Asp	Gly Asn Gln Ala 110 His	Lys Gly Lys 95 Ala Thr	Ser 80 Leu Lys Asp Leu Lus Leu Lys Leu Leu Lus Leu Lus Leu Lus Leu	
65 Let Asp Lys Let	e His Lev O Gly S Cys 130 S Thi	Gln Ala Leu Ser 115 Lys Asr	Asn Gly Lys 100 Glu	Asn Ala 85 Asr Thr Gly Thr	Gly 70 Tyr Glu Phe Val Lys 150 Val	Ala Gly Thr 135	Ile Asp Ile Leu Asn 120 Asp	Ala Thr Ser Lys 105 Lys Ala Characters Ala	Ala Glu Thr 90 Glu Leu Asp Ala	Lys Tyr 75 Leu Lys Ala Glu 155 Ala	Ala 60 Asn Ile Ile Glu Lys 140 Glu	His Lys Asp	Gly Asn Gln Ala 110 His	Lys Gly Lys 95 Ala Thr Lys Lys	Ser 80 Ser 80 Ser Leu Lys Asp Leu 160 La La La La Leu 160 La	
Asp Lys Les Les Lys 14!	e His Lev O Gly S Cys 130 Thi	Gln Ala Leu S Ser 115 Lys Asr	Asn Gly Lys 100 Glu Glu Gly	Asn Ala 85 Asr Thr Gly Thr 169 68	Gly 70 Tyr Glu Phe Val Lys 150	S5 Leu Ala Gly Thr 135 Thr	Ile Asp Ile Asp Asn 120 Asp Lys	Ala Thr Ser Lys 105 Lys Ala Gly	Ala Glu Thr 90 Glu Leu Asp Ala 170 Val	Lys Tyr 75 Leu Lys Ala Glu 155 Ala	Ala 60 Asn Ile Ile Glu Lys 140 Glu Glu Glu	His Lys Asp 125 Glu	Gly Asn Gln Ala 110 His Ala Gly Met	Lys Gly Lys 95 Ala Thr Lys Lys 175 Pro	Ser 80 Ser 80 Ser Leu Lys Asp Leu 160 La La La La Leu 160 La	

CM. 1

Ala Asp Glu Ser Ala Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 220 215 210 Ile Thr Asp Ser Asn Ala Phe Val Leu Ala Val Lys Glu Val Glu Thr 235 230 Leu Val Leu Ser Ile Asp Glu Leu Ala Lys Lys Ala Ile Gly Gln Lys 250 245 Ile Asp Asn Asn Gly Leu Ala Ala Leu Asn Asn Gln Asn Gly Ser 265 Leu Leu Ala Gly Ala Tyr Ala Ile Ser Thr Leu Ile Thr Glu Lys Leu 280 Ser Lys Leu Lys Asn Leu Glu Glu Leu Lys Thr Glu Ile Ala Lys Ala 300 295 Lys Lys Cys Ser Glu Glu Phe Thr Asn Lys Leu Lys Ser Gly His Ala 315 Asp Leu Gly Lys Gln Asp Ala Thr Asp Asp His Ala Lys Ala Ala Ile 325 330 Leu Lys Thr His Ala Thr Thr Asp Lys Gly Ala Lys Glu Phe Lys Asp 345 Leu Phe Glu Ser Val Glu Gly Leu Leu Lys Ala Ala Gln Val Ala Leu 360 355 Thr Asn Ser Val Lys Glu Leu Gly His Arg Asn Asn Ser Gly Gly Asp 380 375 Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys Gly Pro Asn Leu Thr 395 390 Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu Leu Ala Val 410 405 Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu Ser Lys Ala 425 Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu Asp Asn Glu Ala Asn 445 440 435 Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser Lys Leu Ile 455 Thr Gln Lys Leu Ser Val Leu Asn Ser Glu Glu Leu Lys Lys Lys Ile 470 475 Lys Glu Ala Lys Asp Cys Ser Gln Lys Phe Thr Thr Lys Leu Lys Asp 490 Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln Asp Asp Asn Ala Lys 505 Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp Lys Gly Ala Lys Glu 525 520 515 Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser Lys Ala Ala Gln 535 Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn Pro Val Val Ala 555 <210> 53 <211> 1137 <212> DNA <213> ospC Chimera <220> <221> CDS <222> (1)...(1137)

atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser

Al 1

<400> 53

gct Ala	gat Asp	gag Glu	tct Ser 20	gtt Val	aaa Lys	gly aaa	cct Pro	aat Asn 25	ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 30	aaa Lys	aaa Lys	96
att Ile	acg Thr	gat Asp 35	tct Ser	aat Asn	gcg Ala	gtt Val	tta Leu 40	ctt Leu	gct Ala	gtg Val	aaa Lys	gag Glu 45	gtt Val	gaa Glu	gcg Ala	144
ttg Leu	ctg Leu 50	tca Ser	tct Ser	ata Ile	gat Asp	gag Glu 55	ctt Leu	gct Ala	aaa Lys	gct Ala	att Ile 60	ggt Gly	aaa Lys	aaa Lys	ata Ile	192
aaa Lys 65	aac Asn	gat Asp	ggt Gly	agt Ser	tta Leu 70	gat Asp	aat Asn	gaa Glu	gca Ala	aat Asn 75	cgc Arg	aac Asn	gag Glu	tca Ser	ttg Leu 80	240
tta Leu	gca Ala	gga Gly	gct Ala	tat Tyr 85	aca Thr	ata Ile	tca Ser	acc Thr	tta Leu 90	ata Ile	aca Thr	caa Gln	aaa Lys	tta Leu 95	agt Ser	288
aaa Lys	tta Leu	aac Asn	gga Gly 100	tca Ser	gaa Glu	ggt Gly	tta Leu	aag Lys 105	gaa Glu	aag Lys	att Ile	gcc Ala	gca Ala 110	gct Ala	aag Lys	336
aaa Lys	tgc Cys	tct Ser 115	gaa Glu	gag Glu	ttt Phe	agt Ser	act Thr 120	aaa Lys	cta Leu	aaa Lys	gat Asp	aat Asn 125	cat His	gca Ala	cag Gln	384
Leu	Gly 130	Ile	Gln	ggc Gly	Val	Thr 135	Asp	G1u	Asn	Ala	ьуs 140	ьуѕ	Ala	116	Бец	432
Lys 145	Ala	Asn	Ala	gcg Ala	Gly 150	Lys	Asp	Lys	GIY	vai 155	GIU	GIU	Leu	GIU	160	480
Leu	Ser	Gly	Ser	tta Leu 165	Glu	Ser	Leu	Ser	Lys 170	Ala	Ala	гÀг	GIU	175	Leu	528
Ala	Asn	Ser	Val 180		Glu	Leu	Thr	Ser 185	Pro	Val	vai	Hls	190	ASII	ASII	576
Ser	Gly	Gly 195	Asp	Ser	Ala	Ser	Thr 200	Asn	. Pro	Asp	Glu	205	Ala	ьys	gga Gly	624
Pro	Asn 210	Leu	Thr		Ile	Ser 215	Lys	Lys	Ile	Tnr	220	ser	ASI	. Ala	Pile	672
tta Leu 225	Leu	gct Ala	gtg Val	ı aaa . Lys	gaa Glu 230	Val	gag Glu	gct Ala	ttg Leu	ctt Leu 235	ı Ser	tct Ser	ata Ile	gat Asp	gaa Glu 240	720

ch.

### 161 -57/102

ctt Leu	tct Ser	aaa Lys	gct Ala	att Ile 245	ggt Gly	aaa Lys	aaa Lys	ata Ile	aaa Lys 250	aat Asn	gat Asp	ggt Gly	act Thr	tta Leu 255	gat Asp	768
aac Asn	gaa Glu	gca Ala	aat Asn 260	cga Arg	aac Asn	gaa Glu	tca Ser	ttg Leu 265	ata Ile	gca Ala	gga Gly	gct Ala	tat Tyr 270	gaa Glu	ata Ile	816
tca Ser	aaa Lys	cta Leu 275	ata Ile	aca Thr	caa Gln	aaa Lys	tta Leu 280	agt Ser	gta Val	ttg Leu	aat Asn	tca Ser 285	gaa Glu	gaa Glu	tta Leu	864
aag Lys	aaa Lys 290	aaa Lys	att Ile	aaa Lys	gag Glu	gct Ala 295	aag Lys	gat Asp	tgt Cys	tcc Ser	caa Gln 300	aaa Lys	ttt Phe	act Thr	act Thr	912
aag Lys 305	cta Leu	aaa Lys	gat Asp	agt Ser	cat His 310	gca Ala	gag Glu	ctt Leu	ggt Gly	ata Ile 315	caa Gln	agc Ser	gtt Val	cag Gln	gat Asp 320	960
gat Asp	aat Asn	gca Ala	aaa Lys	aaa Lys 325	gct Ala	att Ile	tta Leu	aaa Lys	aca Thr 330	cat His	gga Gly	act Thr	aaa Lys	gac Asp 335	aag Lys	1008
ggt Gly	gct Ala	aaa Lys	gaa Glu 340	ctt Leu	gaa Glu	gag Glu	tta Leu	ttt Phe 345	aaa Lys	tca Ser	cta Leu	gaa Glu	agc Ser 350	ttg Leu	tca Ser	1056
aaa Lys	gca Ala	gcg Ala 355	caa Gln	gca Ala	gca Ala	tta Leu	act Thr 360	aat Asn	tca Ser	gtt Val	aaa Lys	gag Glu 365	ctt Leu	aca Thr	aat Asn	1104
cct Pro	gtt Val 370	gtg Val	gca Ala	gaa Glu	agt Ser	cca Pro 375	aaa Lys	aaa Lys	cct Pro	taa *						1137
<21 <21	0 > 5 1 > 3 2 > P 3 > 0	78 RT	Chim	era												
Met	0> 5 Ala	4 Cys	Asn		Ser	Gly	Lys	Asp	Gly 10	Asn	Thr	Ser	Ala	. Asn	Ser	
1 Ala	Asp	Glu	Ser 20	5 Val	Lys	Gly	Pro	Asn 25		Thr	Glu	Ile	Ser 30		Lys	
		35	Ser				40					45			Ala	
	5.0					55					60				Ile	
65					70					75					Leu 80	
				85					90					95	Ser	
			100	)				105	)				TIC	,	Lys	
Lys	Cys	Ser 115	-	ı Glu	ı Phe	e Ser	120		s Leu	ı Lys	s Asp	125	i HlS	s Alā	a Gln	

Chu,

#### 162 -58/102

130 145 145 150 150 145 150 150 150 150 150 150 150 150 150 160 160 160 160 160 160 160 160 160 16	Leu	Gly	Ile	Gln	Gly	Val	Thr	Asp	Glu	Asn	Ala	Lys 140	Lys	Ala	Ile	Leu	
145						Gly					Val						
Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val His Gly Asn Asn 180 190 190 195 195 195 195 200 205 205 205 205 205 205 205 205 20					Leu					Lys							
Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys Gly 195 Pro Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe 215 225 230 Leu Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu 225 236 Leu Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu Asp 246 257 268 Asn Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile 260 275 280 285 Lys Lys Ile In Fro Gln Lys Leu Ser Val Leu Asn Ser Glu Glu Leu 290 295 Lys Lys Ile Lys Glu Ala Lys Asp Cys Ser Gln Lys Phe Thr Thr 290 Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln Asp 335 Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser 335 Gly Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn 355 Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370     220	Ala	Asn	Ser		165 Lys	Glu	Leu	Thr	Ser	Pro	Val	Val	His	Gly 190	Asn	Asn	
Pro Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe 210				Asp					Asn								
Leu Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu 255			Leu					Lys									
Leu Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu Asp 245  Asn Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile 260  Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu Asn Ser Glu Glu Leu 275  Lys Lys Lys Ile Lys Glu Ala Lys Asp Cys Ser Gln Lys Phe Thr Thr 295  Lys Lys Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln Asp 300  Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp Lys 325  Gly Ala Lys Glu Leu Glu Glu Leu Lys Thr His Gly Thr Lys Asp Lys 325  Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser 345  Lys Ala Ala Gln Ala Ala Lur Thr Asn Ser Val Lys Glu Leu Thr Asn 350  Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370 <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> <pre> </pre> <pre> <pre> </pre> <pre> <pre> </pre> <pre> <pre> <pre> </pre> <pre> <pre> <pre> <pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> </pre> <pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> </pre> <pre> </pre>  <pre>  <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>		Leu					Val										
Asn Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile 260  Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu Asn Ser Glu Glu Leu 280  Lys Lys Lys Ile Lys Glu Ala Lys Asp Cys Ser Gln Lys Phe Thr Thr 290  Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln Asp 315  Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp Lys 325  Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser 345  Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn 355  Pro Val Val Ala Glu Ser Pro Lys Lys Pro 375 <a href="#"></a>						Gly											
Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu Asn Ser Glu Glu Leu 275					Arg												
Lys Lys Lys Sys Ile Lys Glu Ala Lys Asp Cys Ser Gln Lys Phe Thr Thr 290  Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln Asp 315  Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp Lys 325  Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser 340  Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn 355  Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370    2210 > 55  2212 > DNA 2213 > ospC Chimera    220 > 2221 > CDS 2222 > (1) (1158)   240 > 55  atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser Lys Lys Bro 360  gct gat gag tct gtt aaa aggg cct aat ctt aca gaa ata agt aaa aaa aaa aaa aaa Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Lys Lys Cys Bro 370  att acg gat tct aat gcg gtt tta ctt gct gtg aaa gag gtt gaa gcg lu Ala Asp Glu Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 45  ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa  ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa  192  Lys Lys Lys Lys Lys Lys Asp Gly Asn Ile Gly Lys Lys Lys Glu Val Glu Ala 45  ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa  192  Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys Lys Lys Lys Lys Lys Lys Lys Ly				Ile	Thr			2×0	Ser								
Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln Asp 320 310 310 315 320 320 325 325 325 325 325 325 325 325 325 325			Lys	Ile			· ) u հ	Lys	Asp								
Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp Lys 325 335  Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser 345  Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn 355  Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370 <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> </pre> <pre> <pre> <pre> </pre> <pre> </pre> <pre> <pre> <pre> </pre> <pre> <pre> <pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> </pre> <pre> <pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>		Leu	Lys			חוכ	Ala	Glu			31.	,					
Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser 164 Ser 340 345 355  Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn 355 360 365  Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370 375 <pre> &lt;210&gt; 55</pre>	Asp	Asn				Ala	Ile										
Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn 355  Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370 <pre></pre>				2 4 6	Leu	Glu			147								
Pro Val Val Ala Glu Ser Pro Lys Lys Pro 370 <pre></pre>	Lys	Ala		Glr	n Ala	Ala	Lev	Thr	Asn	Ser	· Val	Lys	365 365	ı Lev	ı Thi	c Asn	
<pre> &lt;210&gt; 55 &lt;211&gt; 1158 &lt;212&gt; DNA &lt;213&gt; ospC Chimera  </pre> <pre> &lt;220&gt; &lt;221&gt; CDS &lt;222&gt; (1)(1158)  </pre> <pre> &lt;400&gt; 55 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1</pre>	Pro	_	. Val	L Ala	a Glu	. Ser	Pro	Lys		Pro	)						
<pre> &lt;211&gt; 1158 &lt;212&gt; DNA &lt;213&gt; ospC Chimera  </pre> <pre> &lt;220&gt; &lt;221&gt; CDS &lt;222&gt; (1)(1158)  </pre> <pre> &lt;400&gt; 55 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1</pre>		370															
<pre> &lt;212&gt; DNA &lt;213&gt; ospC Chimera  &lt;220&gt; &lt;221&gt; CDS &lt;222&gt; (1)(1158)  </pre> <pre> &lt;400&gt; 55 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1</pre>																	
<pre> &lt;220&gt; &lt;221&gt; CDS &lt;222&gt; (1)(1158)  </pre> <pre> &lt;400&gt; 55 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1</pre>	<21	L2> I	ANC	Chi	mera												
<pre> &lt;221&gt; CDS &lt;222&gt; (1)(1158)  </pre> <pre> &lt;400&gt; 55 atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca aat tct Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1</pre>			•														
atg gct tgt aat aat tca ggg aaa gat ggg aat aca tct gca dat bee Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser 1 10 15  gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa 96 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 20 25 30  att acg gat tct aat gcg gtt tta ctt gct gtg aaa gag gtt gaa gcg 144 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 35 40 45  ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa 192 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys 600	<22	21> (	CDS (1).	(1	158)												
Met Ala Cys Asn Asn Ser Gly Lys Asp Gly Ash The Ser That 15  gct gat gag tct gtt aaa ggg cct aat ctt aca gaa ata agt aaa aaa 96 Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys 20  att acg gat tct aat gcg gtt tta ctt gct gtg aaa gag gtt gaa gcg 144 Ile Thr Asp Ser Asn Ala Val Leu Leu Ala Val Lys Glu Val Glu Ala 35  ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa 192 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys				t aa	t aa	t tc	a gg	g aa	a ga	t gg	g aa	t ac	a tc	t gc	a aa	t tct	48
Ala Asp Glu Ser Val Lys Gly Pro Ash Leu IIII Glu III Glu II Glu	Me	t Al	a Cy	s As	n As:	n Se	r Gl	у Lу	s As	р ст	y AS	n Th	r Se	r Al	u		
Ala Asp Glu Ser Val Lys Gly Pro Ash Leu IIII Glu III Glu II Glu	gc	t ga	t ga	g to	t gt	t aa	a gg	g cc	t aa	t ct	t ac	a ga	a at	a ag	t aa r Lv	a aaa s Lvs	96
ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa 192 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys	Al	a As	p Gl	u Se	r Va	l Ly	s Gl	y Pr	O AS	n ne	u III	i Gi	u II		1		
ttg ctg tca tct ata gat gaa att gct gct aaa gct att ggt aaa aaa 192 Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys	at	t ac	g ga	it to	t aa r As	t go n Al	g gt a Va	t tt	a ct u Le	t go u Al	t gt	g aa il Ly	a ga 's Gl	ıg gt .u Va	t ga	a gcg u Ala	144
ttg ctg tca tct ata gat gaa att gct gct add gcc doo 330 m Leu Leu Ser Ser Ile Asp Glu Ile Ala Ala Lys Ala Ile Gly Lys Lys			3	5				4	U				7				
	tt Le	u Le	u Se	er Se	et at er Il	a ga .e As	ib Gi	.u 11	t go .e Al	t go .a Al	t aa la Ly	(2 M)	.a	t gg Le Gl	rt aa .y Ly	aa aaa ys Lys	

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ata Ile 65	cac His	caa Gln	aat Asn	aat Asn	ggt Gly 70	ttg Leu	gat Asp	acc Thr	gaa Glu	tat Tyr 75	aat Asn	cac His	aat Asn	gga Gly	tca Ser 80	240
ttg Leu	tta Leu	gcg Ala	gga Gly	gct Ala 85	tat Tyr	gca Ala	ata Ile	tca Ser	acc Thr 90	cta Leu	ata Ile	aaa Lys	caa Gln	aaa Lys 95	tta Leu	288
gat Asp	gga Gly	ttg Leu	aaa Lys 100	aat Asn	gaa Glu	gga Gly	tta Leu	aag Lys 105	gaa Glu	aaa Lys	att Ile	gat Asp	gcg Ala 110	gct Ala	aag Lys	336
aaa Lys	tgt Cys	tct Ser 115	gaa Glu	aca Thr	ttt Phe	act Thr	aat Asn 120	aaa Lys	tta Leu	aaa Lys	gaa Glu	aaa Lys 125	cac His	aca Thr	gat Asp	384
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aaa Lys 145	aca Thr	aat Asn	ggt Gly	act Thr	aaa Lys 150	act Thr	aaa Lys	ggt Gly	gct Ala	gaa Glu 155	gaa Glu	ctt Leu	gga Gly	aaa Lys	tta Leu 160	480
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aaa Lys	cct Pro	ttc Phe 195	His	ggt Gly	aat Asn	aat Asn	tca Ser 200	GIA	ggg ggg	gat Asp	tct Ser	gca Ala 205	tct Ser	act Thr	aat Asn	624
cct Pro	gat Asp 210	Glu	tct Ser	gca Ala	aaa Lys	gga Gly 215	Pro	aat Asn	ctt Leu	acc Thr	gta Val 220	. 110	ago Ser	aaa Lys	aaa Lys	672
att Ile 225	Thr	gat Asp	tct Ser	aat Asn	gca Ala 230	Phe	tta Leu	ctg Lev	gct Ala	gtg Val 235	. гуғ	gaa Glu	gtt Val	gag Glu	gct Ala 240	720
tto Lei	g ctt 1 Lei	t tca 1 Sei	tct Ser	ata 116 245	e Asp	gaa Glu	ctt Leu	tct Ser	aaa Lys 250	A A L	att a Ile	ggt Gly	aaa Lys	aaa Lys 255	a ata 3 Ile 5	768
aaa Lys	a aat s Ası	gat n Asp	ggt Gly 260	/ Thi	tta Leu	ı gat ı Ası	aac Asr	gaa Glu 265	1 Ale	a aat a Asi	cga n Arg	a aad g Asr	gaa Glu 270		a ttg c Leu	816
ata Ilo	a gca e Ala	a gga a Gly 27	y Ala	tat a Tyr	gaa Glu	a ata ı Ile	a tca e Sei 280	г Бу	a cta s Le	a ata ı Ile	a aca	a caa r Gli 289	тпА	a tta s Lei	a agt u Ser	864

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gta	ttg	aat	tca	gaa	gaa	tta	aag	aaa	aaa	att	aaa	gag	gct	aag	gat	912
Val	Leu 290	Asn	Ser	GIU	Glu	ьец 295	гÀг	гус	ьуѕ	116	300	GIU	Ald	пур	Asp	
tgt Cys 305	tcc Ser	caa Gln	aaa Lys	ttt Phe	act Thr 310	act Thr	aag Lys	cta Leu	aaa Lys	gat Asp 315	agt Ser	cat His	gca Ala	gag Glu	ctt Leu 320	960
ggt Gly	ata Ile	caa Gln	agc Ser	gtt Val 325	cag Gln	gat Asp	gat Asp	aat Asn	gca Ala 330	aaa Lys	aaa Lys	gct Ala	att Ile	tta Leu 335	aaa Lys	1008
aca Thr	cat His	gga Gly	act Thr 340	aaa Lys	gac Asp	aag Lys	ggt Gly	gct Ala 345	aaa Lys	gaa Glu	ctt Leu	gaa Glu	gag Glu 350	tta Leu	ttt Phe	1056
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		_														
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### 105 61/102

Lys	Pro		His	Gly	Asn	Asn	Ser 200	Gly	Gly	Asp	Ser	Ala 205	Ser	Thr	Asn	
Pro	Asp 210	195 Glu	Ser	Ala	Lys	Gly 215	Pro	Asn	Leu	Thr	Val 220		Ser	Lys	Lys	
	Thr	Asp	Ser	Asn		Phe	Leu	Leu	Ala	Val	Lys	Glu	Val	Glu	Ala 240	
225 Leu	Leu	Ser	Ser	Ile	230 Asp	Glu	Leu	Ser	Lys 250	235 Ala	Ile	Gly	Lys	Lys 255		
Lys	Asn	Asp	Gly 260	245 Thr	Leu	Asp	Asn	Glu 265		Asn	Arg	Asn	Glu 270	Ser	Leu	
Ile	Ala		Ala	Tyr	Glu	Ile	Ser 280	Lys	Leu	Ile	Thr	Gln 285	Lys	Leu	Ser	
Val	Leu 290	275 Asn	Ser	Glu	Glu	Leu 295	Lys	Lys	Lys	Ile	Lys 300		Ala	Lys	Asp	
Cys 305	Ser	Gln	Lys	Phe	Thr 310		Lys	Leu	Lys	Asp 315	Ser	His	Ala	Glu	Leu 320	
Gly	Ile	Gln	Ser	Val 325	Gln	Asp	Asp	Asn	Ala 330	Lys	Lys	Ala	Ile	Leu 335	Lys	
Thr	His	Gly	Thr 340	Lys	Asp	Lys	Gly	Ala 345		Glu	Leu	Glu	Glu 350	Leu	Phe	
Lys	Ser	Leu 355	Glu	Ser	Leu	Ser	Lys 360		Ala	Gln	Ala	Ala 365	Leu	Thr	Asn	
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gct	gac	gag	tct	gcg	aaa	999	cct	aat	ctt	aca	gaa	ata	ago	aaa	aaa	96
Ala	Asp	Glu	Ser 20	Ala	Lys	GIY	Pro	Asn 25	Leu	. 1111	Giu	116	30	цув	цуз	
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116	Thr	35		ASII	AIG	FIIC	40	)			-1-	45				
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ata Ile	e Asp	aat Asr	aat n Asr	aat 1 Asn	ggt Gl <sub>y</sub>	/ Lei	gct Ala	gct Ala	tta Leu	a aat a Asr 75	ı Asr	cag Glr	g aat n Asr	gga Gly	tcg Ser 80	240

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agt Ser	aaa Lys	ttg Leu	aaa Lys 100	aat Asn	tta Leu	gaa Glu	gaa Glu	tta Leu 105	aag Lys	aca Thr	gaa Glu	att Ile	gca Ala 110	aag Lys	gct Ala	336
aag Lys	aaa Lys	tgt Cys 115	tcc Ser	gaa Glu	gaa Glu	ttt Phe	act Thr 120	aat Asn	aaa Lys	cta Leu	aaa Lys	agt Ser 125	ggt Gly	cat His	gca Ala	384
gat Asp	ctt Leu 130	ggc Gly	aaa Lys	cag Gln	gat Asp	gct Ala 135	acc Thr	gat Asp	gat Asp	cat His	gca Ala 140	aaa Lys	gca Ala	gct Ala	att Ile	432
tta Leu 145	aaa Lys	aca Thr	cat His	gca Ala	act Thr 150	acc Thr	gat Asp	aaa Lys	ggt Gly	gct Ala 155	aaa Lys	gaa Glu	ttt Phe	aaa Lys	gat Asp 160	480
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aaa Lys	aaa Lys	cct Pro 195	cat His	atg Met	gct Ala	aat Asn	aat Asn 200	tca Ser	ggt Gly	ggg Gly	gat Asp	tct Ser 205	gca Ala	tct Ser	act Thr	624
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agt Ser	gta Val 290	Leu	aat Asn	tca Ser	gaa Glu	gaa Glu 295	Leu	aag Lys	aaa Lys	aaa Lys	att Ile 300	Lys	gag Glu	gct Ala	aag Lys	912
gat Asp 305	Сув	tcc Ser	caa Glr	aaa Lys	ttt Phe 310	Thr	act Thr	aag Lys	cta Leu	aaa Lys 315	Asp	agt Ser	cat His	gca Ala	gag Glu 320	960

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ctt Leu	ggt Gly	ata Ile	caa Gln	agc Ser 325	gtt Val	cag Gln	gat Asp	gat Asp	aat Asn 330	gca Ala	aaa Lys	aaa Lys	gct Ala	att Ile 335	tta Leu	1008
aaa Lys	aca Thr	cat His	gga Gly 340	act Thr	aaa Lys	gac Asp	aag Lys	ggt Gly 345	gct Ala	aaa Lys	gaa Glu	ctt Leu	gaa Glu 350	gag Glu	tta Leu	1056
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	EΛ	Leu				55					60				Lys	
	Asp				70					/ 5					Ser 80	
Leu				ឧធ					90					23	Leu	
			100					105					110		: Ala	
		115					120					123			Ala	
	120					1.35	i				140	,			Ile	
115					150	)				155	)				Asp 160	
				165	5				1/0	)				1/-		
			180	)				185	5				190	,	r Pro	
		195	;				200	)				205	)		r Thr	
	210	Asp	Glı			219	5				220	,			r Lys	
Lys 225	Ile	Thi	Asp	Sei	230		a Phe	e Lei	ı Leı	1 Ala 235	a Vai	l Lys	s Glu	ı Val	1 Glu 240	

	Leu	Leu	Ser	Ser	Ile	Asp	Glu	Leu	Ser	Lys	Ala	Ile	Gl	y I	ys 55	Ly	5	
Ile				245 Gly				Asn										
Leu	Ile	Ala	260 Gly	Ala	Tyr	Glu	Ile	Ser	Lys	Leu	Ile	Thr 285	G]	n I	ys	Le	u	
				Ser			Leu											
				Lys		Thr												
				Ser 325	Val													
Lys	Thr	His	Gly 340	Thr	Lys	Asp	Lys	Gly 345	Ala	Lys	Glu	Le	u G. 3!	lu (	Glu	ье	u ···	
Phe	Lys	Ser	Leu	Glu	Ser	Leu	Ser 360	Lys	Ala	Ala	Gln	36	а А. 5	ıa .~	ьeu	11. T.s.	ıc	
Asn	Ser		Lys	Glu	Leu	Thr 375	Asn	Pro	val	. Val	380	(GI	u S	er	PIO	υγ		
Lys 385	Pro																	
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<40 ato Met 1 gca Ala	00> ! g agg c Arg	59 a tt g Le a aa n Ly	a tt u Le a gg s Gl	a atau Ila 5 t gc y Al	t gaq a Gl	g to	a at	t gg e Gl	a to y Se	c tg	t aa s As	t aan Aa	at i	tca Ser 30	ggg Gly	ga y L	aa 9 ys ect 1	
<400 ato Met 1 gca Ala ga As	00> ! g agg c Arg a ca a Gl t gg p Gl	a tt g Le a aa n Ly g aa y As	a tt u Le a gg s Gl 2 t ac	a ato u Ilo 5 t gc y Al 0	t gag a Glu t gc r Al	g to u Se a aa a As	a atr Il	t gg e Gl 2 t gc	a to y Se 5	c tg r Cy at ga	t aass Ass	t aan Aa	at finds	tca Ser 30 aaa Lys	999 Gl	g a y L g c y F	aa 9 ys ct 1 Pro	6
<400 ato Met 1 gca Ala ga As	00> ! g agg a ca a ca g Gl t gg p Gl	a tt g Le a aa n Ly g aa y As	a tt u Le a gg s Gl 2 t ac in Th	a atau Ila 5 t gc y Al 0	t gag a Glu t gc r Al	g to u Se a aa a As	a atr Il	t gg e Gl et go er Al	a to y Se 5 ct ga	c tg r Cy	t aas As As ag to	t aan Aast g	at sn state at al at at at at at at at	tca Ser 30 aaa Lys	ggg Gl; gg	g a g a g c g c	aa 9 yys cct 1 Pro	6
<pre>&lt;40 ato ato Met  1 gca Ala ga As </pre>	00 > ! g aga c Are a ca a Gl t gg p Gl t ct n Le	a aa a	a ttu Le a gg s Gl 2 t ac n Th	a atau Ilo	t gag a Gli t gc r Al	g togus Seria a aa	a atr Il t tc n Se - 4 a aas	t gg e Gl 2 et go er Al	a to y Se t ga a As	c tg r Cy at ga sp Gl	t aas As ag to	t aan Aast ger V	at s sn s tt s al s 45 at	tca Ser 30 aaa Lys gcg Ala	ggg Gl gg Gl	g a g c g c g c g c g c g c g c g c g c	aa 9 yys cct 1 Pro cta 1	44
<pre>&lt;40 atc atc Met  1 gca Ala ga As aaa As</pre>	00 > ! g aga a ca a Gl t gg p Gl t ct n Le	a aa a	a ttu Le a gg s Gl 2 t ac n Th	a atou Ilo 5 t gc y Al 0 a tc ir Se	t gag a Gli t gc r Al	g to: a aa a As t aa r Ly	a atr Il t tc n Se a aa s Ly	t gg e Gl 2 cr Al 0	a to y Se 5 a As	c tg c tg c tg dt ga gg ga nr As	t aass Assag to	t aan Aan Aar V	at finds	tca Ser 30 aaa Lys gcg Ala	ggg Gl gg Gl gt va	g a g c g c g c g t t t t l l l a a	aa 9 yys cct 1 Pro cta 1 Leu	6
<pre>&lt;40 atcomet for the second secon</pre>	oo > ! g aga c Are a ca a Gl t gg p Gl t ct n Le t gc u Al	a aa a	a ttu Le a gg s Gl 2 t ac n Th sa ga ar Gl	a atau Ilo 5 t gc y Al 0 car Se a atau Ilo aa ga	t gaga Gli t gc r Al a agga e Se	g too Se a aa a As t aa r Ly 5 t ga	a atr Il t tc n Se	t gg e Gl 2 t gc r Al 0	a to y Se t ga a As	c tg c tga gga cg ga cg ga cg ta	t aas s As s g to	t aan Alet ger V	at the state of th	tca Ser 30 aaa Lys gcg Ala gat	ggg Gl; gg Gl gt Va	g a g c g c g c g c g c g c g c g c g c	aa 9 yys ct 1 Pro tta 1 Leu att 2 Ile 80	44
<pre>&lt;40 atg Atg Met 1 gca Ala ga Asg  ct Le 6</pre>	00 > ! g agg c Arg a ca a Gl t gg p Gl t ct n Le t gc u Al	a aa a	a ttu Le a ggg s Gl t ac n Th s a ga ar Gl	a ato II of the second of the	t gaga Gli t gc. r Al a agg gt. u Va	g tca g tca a aa a As t aa r Ly 5 t ga 10	a atr Il t tc n Se a aa s Ly s a ag a	t gg e Gl 2 t gc r Al 0	a to y Se t ga a As t ac le Th	c tg r Cy at gas p Gl cg ga ar As	t aas s As s g to s at to s s c a to s	t aan	at the state of th	tca Ser 30 aaa Lys gcg Ala gat Asp	999 Gl	g a g c g c g c g c g c g c g c g c g c	aa 9 yys ct 1 Pro tta 1 Leu att 2 Ile 80 gat 2	6.44
<pre>&lt;40 atcomet for the second secon</pre>	on signature of the state of th	a atternation of the second se	a ttu Le a ggg s Gl t ac n Th s a ga ir Gl aa ga ys A	a atau II o a tour Secretaria atau II o a tour Secretaria atau II o a atau II	t gaga Gli t gc. r Al a agger e Se	g tca g tca a Se a aa a As t aa r Ly 5 t ga 10	a atr Il t tc n Se a aa s Ly s a aa s Ly s a aa s Ly s	t gg e Gl t gG tr Al o at cg tr la La aa ar	a to y Se t ga a As t ac t ac t ac t ac t ac t ac	c tgar cgar As	t aas s As s ag to s at to s a	t aa n Aa	at the sal tale	tca Ser 30 aaaa Lys gcg Ala gat Asr GGl}	ggg Gl gg Gl Va ga Gl Ltt Lt gg	g a g c g c g c g c g c g c g c g c g c	aa 9 yys ct 1 Pro tta 1 Leu att 2 Ile 80 gat 2 Asp	6.44
<pre>&lt;40 ate ate Met 1 gca Ala As  ct Le 6 Ala </pre>	on signature of the state of th	a atternation of the second se	a ttu Le a ggg s Gl t ach Th sa ga ar Gl aa ga ys Al at a yr A	a ato II of the second of the	t gaga Gli t gc. r Al a agger e Se	g tca g tca a Se a aa a As t aa r Ly 5 t ga 10	a atr Il t tc n Se a aa s Ly s a aa s Ly s a aa s Ly s	t gg e Gl et gc er Al eg ti la Le eg ti la Le eg t	a to y Se t ga a As t ac t ac t ac t ac t ac t ac	c tgar cgar As	t aas s As s ag to s at to s a	t aa n Aa	at the sal tale	tca Ser 30 aaaa Lys gcg Ala gat Asr GGl}	gggggggggggggggggggggggggggggggggggggg	g a g c g c g c g c g c g c g c g c g c	aa 9 yys ct 1 Pro tta 1 Leu att 2 Ile 80 gat 2 Asp	6 .44 .192 .240 .288

by x

Ser	Thr	Leu 115	ata Ile	гàг	GIN	гуз	120	vab	O <sub>1</sub>		_,	125					384
Lys	Glu 130	Lys	att Ile	Asp	Ala	135	пуъ	БУЗ	Cyb	50-	140						432
Lys 145	Leu	Lys	gaa Glu	гàз	150	THE	Asp	пеа	O <sub>1</sub>	155		•				160	480
gct Ala	gat Asp	gca Ala	aaa Lys	gaa Glu 165	gcc Ala	att Ile	tta Leu	aaa Lys	aca Thr 170	aat Asn	ggt	act Thr	aaa Ly:	a a s T 1	ct hr .75	aaa Lys	528
ggt Gly	gct Ala	gaa Glu	gaa Glu 180	ctt Leu	gga Gly	aaa Lys	tta Leu	ttt Phe 185	gaa Glu	tca Ser	gta Val	a gag l Glu	g gt 1 Va 19	c t 1 I 0	tg Leu	tca Ser	576
aaa Lys	gca Ala	gct Ala 195	aaa Lys	gag Glu	atg Met	ctt Leu	gct Ala 200	Maii	tca Ser	gtt Val	aaa Ly	a gag s Glu 20		t a u I	aca Thr	agc Ser	624
cct Pro	gtt Val	Va.	g gca Ala	gaa Glu	agt Ser	cca Pro 215	АІА	atg Met	gta Val	aat Asr	aa 1 As 22		a gg r Gl	y i	aaa Lys	gat Asp	672
999 Gly 225	Asr	aca Thi	a tct r Ser	gca Ala	aat Asn 230	Ser	gct Ala	gat Asp	gag Glu	tct Ser 23!		t aa l Ly	a gg s G]	ly I	cct Pro	aat Asn 240	720
ctt Lei	aca ı Thi	a gaa c Gl	a ata u Ile	a agt e Ser 249	: ГА	aaa Lys	att ; Ile	aca Thi	gaa Glu 250		t aa r As	c go n Al	agt aVa	t al	gtt Val 255	ctc Leu	768
gc: Ala	c gte a Va	g aa l Ly	a gaa s Glu 26	ı Va.	gaa l Glu	a act	t ttq r Lei	g cti 1 Lei 26	1 111.	a tc r Se	t at r Il	a ga Le As		ag lu 70	ctt Leu	gct Ala	816
aa Ly	a gc s Al	t at a Il 27	e Gl	t aaa y Ly	a aaa s Lya	a at	a aa e Ly 28	S AS	c ga n As	t gt p⁄Va	t ag 1 Se	gt tt er Le 28	a g eu A 85	at sp	aat Asn	gag Glu	864
gc Al	a ga a As 29	p Hi	c aa s As	c gg n Gl	a tc y Se	a tt r Le 29	u 11	a tc e Se	a gg r Gl	a go y Al	· ~	at ti yr Lo	ca a eu I	tt le	tca Sei	a aac Asn	912
tt Le 30	u Il	a ac e Th	a aa nr Ly	a aa s Ly	a at s Il 31	e Se	t go r Al	a at a Il	a aa e Ly	5 AL	at to sp S L5	ca g er G	ga g ly G	jaa Blu	tto Lei	g aag 1 Lys 320	960
gc Al	a ga .a Gl	ia at Lu I	t ga le Gl	ia aa .u Ly 32	s Al	t aa .a Ly	ıg aa 's Ly	ia t <u>c</u> 's Cy	5 50	et ga er Gi	aa g lu G	aa t lu P	tt a	act Thr	gc Ala 33	t aaa a Lys 5	1008

### 110 -66/102

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tta ( Leu	aaa Lys	ggt Gly	gaa Glu 340	cac His	aca Thr	gat Asp	ьeu	ggt Gly 345	aaa Lys	gaa Glu	ggc Gly	gtt Val	act Thr 350	gat Asp	gat Asp	1056
aat Asn	gca Ala	aaa Lys 355	aaa Lys	gcc Ala	att Ile	tta Leu	aaa Lys 360	aca Thr	aat Asn	aat Asn	gat Asp	aaa Lys 365	act Thr	aag Lys	ggc Gly	1104
gct Ala	gat Asp 370	gaa Glu	ctt Leu	gaa Glu	aag Lys	tta Leu 375	ttt Phe	gaa Glu	tca Ser	gta Val	aaa Lys 380	aac Asn	ttg Leu	tca Ser	aaa Lys	1152
gca Ala 385	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 390	act Thr	aat Asn	tca Ser	gtt Val	aaa Lys 395	gag Glu	ctt Leu	aca Thr	agc Ser		1197
<211 <212	)> 60 L> 39 2> PI 3> Os	99 RT	Chim	era												
Met	)> 6 Arg	0 Leu	Leu	Ile	Gly	Phe	Ala	Leu	Ala 10	Leu	Ala	Leu	Ile	Gly 15	Cys	
			20					フカ	Ser				50		Lys	
		2 5	Thr				4()	Ala				73			Pro	
		Thr				55					00				Leu	
	Ala				70					75					Ile 80	
Ala				0 =					90						Asp	
			100	١				105					2. 2. 0		Ile	
		776	-				120						,		Leu	
	4 2 0					774					74/	,			Asn	
	Leu	ı Lys			7 5 (	1				10-	,				160	
Ala	Asp			165					1/(	,				, .		
			10/	٦.				185	)				17	,	Ser	
		101	_				200	)				20.	,		r Ser	
		l Vai	l Ala			211	5				44	U			s Asp	
Gly	/ Ası	n Th	r Se	r Ala	a Ası	ı Se	r Ala	a Ası	o Gl	u Sei	r Va.	т гА:	s GI	y Pr	o Asn 240	
225				e Sei	230 Lys	1				u Se	)				l Leu	
Ala	a Vai	l Ly	s Gl		l Gl	u Th	r Le	u Lei 26!	u Th	r Se	r Il	e As	p Gl 27	u Le	u Ala	
			2 3	-												

#### 111 -67/102

Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Val Ser Leu Asp Asn Glu 285 280 Ala Asp His Asn Gly Ser Leu Ile Ser Gly Ala Tyr Leu Ile Ser Asn 295 Leu Ile Thr Lys Lys Ile Ser Ala Ile Lys Asp Ser Gly Glu Leu Lys 315 Ala Glu Ile Glu Lys Ala Lys Lys Cys Ser Glu Glu Phe Thr Ala Lys 310 330 325 Leu Lys Gly Glu His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp Asp 345 Asn Ala Lys Lys Ala Ile Leu Lys Thr Asn Asn Asp Lys Thr Lys Gly 340 360 Ala Asp Glu Leu Glu Lys Leu Phe Glu Ser Val Lys Asn Leu Ser Lys 380 375 Ala Ala Lys Glu Met Leu Thr Asn Ser Val Lys Glu Leu Thr Ser 395 390 <210> 61 <211> 1196 <212> DNA <213> ospC Chimera <220> <221> CDS <222> (1)...(1196) atg aga tta tta ata gga ttt gct tta gcg tta gct tta ata gga tgt Met Arg Leu Leu Ile Gly Phe Ala Leu Ala Leu Ala Leu Ile Gly Cys gca caa aaa ggt gct gag tca att gga tcc tgt aat aat tca ggg aaa Ala Gln Lys Gly Ala Glu Ser Ile Gly Ser Cys Asn Asn Ser Gly Lys gat ggg aat aca tct gca aat tct gct gat gag tct gtt aaa ggg cct Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro aat ctt aca gaa ata agt aaa aaa att acg gat tct aat gcg gtt tta 192 Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu ctt gct gtg aaa gag gtt gaa gcg ttg ctg tca tct ata gat gaa att 240 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 70 gct gct aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat 288 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp 90 acc gaa tat aat cac aat gga tca ttg tta gcg gga gct tat gca ata 336 Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile 105 tca acc cta ata aaa caa aaa tta gat gga ttg aaa aat gaa gga tta 384 Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu 120

aag Lys	gaa Glu 130	aaa Lys	att Ile	gat Asp	gcg Ala	gct Ala 135	aag Lys	aaa Lys	tgt Cys	tct Ser	gaa Glu 140	aca Thr	ttt Phe	act Thr	aat Asn	432
aaa Lys 145	tta Leu	aaa Lys	gaa Glu	aaa Lys	cac His 150	aca Thr	gat Asp	ctt Leu	ggt Gly	aaa Lys 155	gaa Glu	ggt Gly	gtt Val	act Thr	gat Asp 160	480
gct Ala	gat Asp	gca Ala	aaa Lys	gaa Glu 165	gcc Ala	att Ile	tta Leu	aaa Lys	aca Thr 170	aat Asn	ggt Gly	act Thr	aaa Lys	act Thr 175	aaa Lys	528
ggt Gly	gct Ala	gaa Glu	gaa Glu 180	ctt Leu	gga Gly	aaa Lys	tta Leu	ttt Phe 185	gaa Glu	tca Ser	gta Val	gag Glu	gtc Val 190	ttg Leu	tca Ser	576
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cct Pro	gtt Val 210	gtg Val	gca Ala	gaa Glu	agt Ser	cca Pro 215	gcc Ala	atg Met	gta Val	aat Asn	aat Asn 220	tca Ser	gga Gly	aaa Lys	gat Asp	672
ggg Gly 225	aat Asn	aca Thr	tct Ser	gca Ala	aat Asn 230	tct Ser	gct Ala	gat Asp	gag Glu	tct Ser 235	gtt Val	aaa Lys	ggg ggg	cct Pro	aat Asn 240	720
ctt Leu	aca Thr	gaa Glu	ata Ile	agt Ser 245	aaa Lys	aaa Lys	att Ile	aca Thr	gaa Glu 250	tct Ser	aac Asn	gca Ala	gtt Val	gtt Val 255	ctg Leu	768
gct Ala	gtg Val	aaa Lys	gaa Glu 260	Ile	gaa Glu	act Thr	ttg Leu	ctt Leu 265	gca Ala	tct Ser	ata Ile	gat Asp	gaa Glu 270	ctt Leu	gct Ala	816
act Thr	aaa Lys	gct Ala 275	att Ile	ggt Gly	aaa Lys	aaa Lys	ata Ile 280	caa Gln	caa Gln	aat Asn	ggt Gly	ggt Gly 285	tta Leu	gct Ala	gtc Val	864
gaa Glu	gcg Ala 290	Gly 999	cat His	aat Asn	gga Gly	aca Thr 295	ttg Leu	tta Leu	gca Ala	ggt Gly	gct Ala 300	tat Tyr	aca Thr	ata Ile	tca Ser	912
aaa Lys 305	Leu	ata Ile	aca Thr	caa Gln	aaa Lys 310	tta Leu	gat Asp	gga Gly	ttg Leu	aaa Lys 315	Asn	tca Ser	gaa Glu	aaa Lys	tta Leu 320	960
aag Lys	gaa Glu	aaa Lys	att Ile	gaa Glu 325	Asn	gct Ala	aag Lys	aaa Lys	tgt Cys 330	Ser	gaa Glu	gat Asp	ttt Phe	act Thr 335	ьуs	1008
aaa Lys	cta Leu	gaa Glu	gga Gly 340	Glu	cat His	gcg Ala	caa Gln	ctt Leu 345	Gly	att Ile	gaa Glu	aat Asn	gtt Val 350	Thr	gat Asp	1056

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#### 117 -69/102

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gag Glu	Asn .	gca Ala 355	aaa Lys	aaa Lys	gct Ala	att Ile	tta Leu 360	ata Ile	aca Thr	gat Asp	gca Ala	gct Ala 365	aaa Lys	gat Asp	aag Lys	1104
ggc Gly	gct Ala 370	gca Ala	gag Glu	ctt Leu	gaa Glu	aag Lys 375	cta Leu	ttt Phe	aaa Lys	gca Ala	gta Val 380	gaa Glu	aac Asn	ttg Leu	gca Ala	1152
aaa Lys 385	gca Ala	gct Ala	aaa Lys	gag Glu	atg Met 390	ctt Leu	gct Ala	aat Asn	tca Ser	gtt Val 395	aaa Lys	gag Glu	ctt Leu	ac		1196
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			$\sim \sim$	Ala				25					50	Gly		
		3 E	Thr				40					<b>4</b> J		Gly		
	EΛ					55					00			Val		
~~	Ala				70					75				Glu	00	
Ala				25					90					Leu 95		
			100	His				T02					110		Ile	
		115	Ile				120					123			Leu	
	120	Lys				135					140				Asn	
115	Leu				150	Thr	Asp			TOO					160	
Ala	Asp			165	Ala	Ile			1/0					1,0		
			100	Leu	Gly			185					100	,	Ser	
		105	Lys	Glu			200	1				20.	,		Ser	
	212	Val	Ala			215	Ala	Met			22	,			asp.	
225	Asn	Thr			230	ser	Ala			233	)				240	
	Thr			245	Lys	Lys			250	ı Sei	Ası			25.		
			260	ı Ile	e Glu			265	ı Alá	a Sei			2,,	•	ı Ala	
		275	ı Ile	e Gly			280	e Glr	ı Glı			40.	,		a Val	
Glu	1 Ala 290	a Gly	, / His	s Ası	n Gly	7 Thi 29	c Lev	ı Leı	ı Ala	a Gly	7 Ala 30	а Ту: 0	r Th	r Ile	e Ser	
								-								

HI.

Lys Leu Il	al-	Tura Len	Asp G	lv Leu	Lys .	Asn S	er Glu	Lys	Leu	
Lys Leu Il	e Thr Gir.	310	. дар С	- 0	315	Clu A	sn Phe	Thr	320 Lys	
305 Lys Glu L)	s Ile Glu 325	ı Asn Ala S	Lys L	ys Cys 330	Ser	G14 A	.up	335	λen	
Lys Leu G	lu Gly Gli	l His Ala	Gln L	eu Gly 45	Ile	Glu A	sn vai 350	THE	Asp	
Glu Asn A	340 la Lys Ly:	s Ala Ile	Leu I	le Thr	Asp	Ala A	la Lys	Asp	Lys	
Gly Ala A	55	n Glu Iv	360 s Leu P	he Lys	Ala	Val 0	Blu Asn	Leu	Ala	
GIY AIA A 370	la Giu ne	37	. 312 7	en Ser	· Val	380 Lvs (	3lu Lev	L		
370 Lys Ala A 385	la Lys Gl	и мет ње 390	l Ala F	isii bez	395					
505										
<210> 63										
<211> 118 <212> DNA										
<213> osp	C Chimera	L								
<220>										
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atg aga t Met Arg l	ta tta at Leu Leu I	ta gga ti le Gly Pi	ne Ala	шси		Ala	Leu Il	e Gly 15	cys	
1	;	5		_	. •					96
gca caa	aaa ggt g Lys Gly A	ct gag to	ca att	gga to	c tgt r Cys	aat Asn	Asn Se	r Gly	, Lys	50
Ala Gln	Lys Gly A 20	ia Giu S	51 110	25	•		3	0		
ast aga	aat aca t	ct qca a	at tct	gct ga	at gag	g tct	gtt aa	a ggg	g cct	144
Asp Gly	Asn Thr S	er Ala A	sn Ser 40	Ala As	sp Gli	ı Ser	45	's GI	y 110	
	35			a++ 3/	ra dai	t tat	aat q	eq gt	t tta	192
aat ctt	aca gaa a Thr Glu I	ta agt a le Ser I	aa aaa ys Lys	Ile T	nr As	p Ser	Asn A	la Va	l Leu	
50			55							240
ctt gct	gtg aaa g	gag gtt g	aa gcg	ttg c	tg tc	a tct r Ser	ata g	at ga sp Gl	g ctt u Leu	240
Leu Ala 65	gtg aaa g Val Lys (	3lu Val G 70	ilu Ala	цеи п		5		-	80	
	gct att	rat aaa a	aa ata	aaa a	ac ga	t ggt	agt t	ta ga	t aat	288
gct aaa Ala Lys	gct att q Ala Ile (	зта газ т	Lys Ile	Lys A	sn Ās 90	p Gly	ser L	eu As	sp Asn 95	
		85								336
gaa gca	aat cgc Asn Arg	aac gag	ca ttg Ser Lev	tta 9 Leu A	ıca gg Ma Gl	ga gci Ly Ala	a Tyr T	hr I	le Ser	
	100			103						
acc tta	ata aca	caa aaa	tta agt	aaa t	ta aa	ac gga	a tca g	gaa ge	gt tta ly Leu	384
Thr Leu	ata aca Ile Thr 115	Gln Lys	Leu Sei 120	_ шуз з	Jeu A	211 GT	125		•	
			aat ee	- aaa 1	tac t	ct qa	a gag t	tt a	gt act	432
aag gaa Lys Glu	aag att Lys Ile	Ala Ala	нта пу	s Lys	Cys S	er Gl	u Glū I n	he S	er Thr	
130			135			1.4	•			

aaa Lys 145	cta Leu	aaa Lys	gat Asp	Asn	cat His 150	gca Ala	cag Gln	ctt Leu	ggt Gly	ata Ile 155	cag Gln	ggc Gly	gtt Val	act Thr	gat Asp 160	480
gaa Glu	aat Asn	gca Ala	aaa Lys	aaa Lys 165	gct Ala	att Ile	tta Leu	aaa Lys	gca Ala 170	aat Asn	gca Ala	gcg Ala	ggt Gly	aaa Lys 175	gat Asp	528
aag Lys	ggc Gly	gtt Val	gaa Glu 180	gaa Glu	ctt Leu	gaa Glu	aag Lys	ttg Leu 185	tcc Ser	gga Gly	tca Ser	tta Leu	gaa Glu 190	agc Ser	tta Leu	576
tca Ser	aaa Lys	gca Ala 195	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 200	gct Ala	aat Asn	tca Ser	gtt Val	aaa Lys 205	gag Glu	ctt Leu	aca Thr	624
agc Ser	cct Pro 210	gtt Val	gtc Val	cat His	ggt Gly	aat Asn 215	aat Asn	tca Ser	ggg ggg	aaa Lys	gat Asp 220	Gly 999	aat Asn	aca Thr	tct Ser	672
gca Ala 225	Asn	tct Ser	gct Ala	gat Asp	gag Glu 230	tct Ser	gtt Val	aaa Lys	ggg Gly	cct Pro 235	aat Asn	ctt Leu	aca Thr	gaa Glu	ata Ile 240	720
agt Ser	aaa Lys	aaa Lys	att	aca Thr 245	gaa Glu	tct Ser	aac Asn	gca Ala	gtt Val 250	gtt Val	ctc Leu	gcc Ala	gtg Val	aaa Lys 255	gaa Glu	768
gtt Val	gaa Glu	act Thr	ttg Leu 260	Leu	aca Thr	tct Ser	ata Ile	gat Asp 265	GIU	ctt Leu	gct Ala	aaa Lys	gct Ala 270	att Ile	ggt Gly	816
aaa Lys	aaa Lys	ata Ile 275	Lys	aac Asn	gat Asp	gtt Val	agt Ser 280	Leu	gat Asp	aat Asn	gag Glu	gca Ala 285	. Asp	cac His	aac Asn	864
gga Gly	tca Ser 290	Leu	a ata ı Ile	tca Ser	gga Gly	gca Ala 295	туг	tta Leu	att Ile	tca Ser	aac Asr 300	шс	ata Ile	aca Thr	aaa Lys	912
aaa Lys 305	: Ile	a agt	z gca r Ala	a ata	aaa Lys 310	Asp	tca Ser	gga Gly	a gaa / Glu	т те	g aag 1 Lys 5	, ATC	ı gaə ı Glu	att i Ile	gaa Glu 320	960
aaq Lys	g gct s Ala	a Ly	g aaa s Lys	a tgt s Cys 325	s Ser	gaa Glu	a gaa ı Glı	a ttt ı Phe	act Thi	LATO	aaa a Lys	a tta s Lei	a aaa 1 Lys	a ggt s Gly 335	gaa Glu	1008
cae Hi:	c aca	a ga r As	t cti p Lei 34	ı Gly	t aaa y Lys	a gaa	a ggo u Gl	gti Y Vai 34	L TII.	t gat r Asj	t gat p As	t aat o Asi	gca n Ala 350	~ _J.	a aaa s Lys	1056
gc Al	c at	t tt e Le 35	u Ly	a acas	a aat r Ası	t aa n As:	t ga n As 36	ь га	a ac s Th	t aag r Ly	g gg s Gl	c gct y Ala 36	a AS	t gaa p Gl	a ctt u Leu	1104

Al A

gaa aag tta ttt gaa tca gta aaa aac ttg tca aaa gca gct aaa gag 1152 Glu Lys Leu Phe Glu Ser Val Lys Asn Leu Ser Lys Ala Ala Lys Glu 375 370 1185 atg ctt act aat tca gtt aaa gag ctt aca agc Met Leu Thr Asn Ser Val Lys Glu Leu Thr Ser 390 <210> 64 <211> 395 <212> PRT <213> ospC Chimera <400> 64 Met Arg Leu Leu Ile Gly Phe Ala Leu Ala Leu Ala Leu Ile Gly Cys Ala Gln Lys Gly Ala Glu Ser Ile Gly Ser Cys Asn Asn Ser Gly Lys 20 25 Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu 55 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 75 Ala Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Ser Leu Asp Asn 90 Glu Ala Asn Arg Asn Glu Ser Leu Leu Ala Gly Ala Tyr Thr Ile Ser 105 100 Thr Leu Ile Thr Gln Lys Leu Ser Lys Leu Asn Gly Ser Glu Gly Leu 120 Lys Glu Lys Ile Ala Ala Lys Lys Cys Ser Glu Glu Phe Ser Thr 140 135 Lys Leu Lys Asp Asn His Ala Gln Leu Gly Ile Gln Gly Val Thr Asp 155 150 Glu Asn Ala Lys Lys Ala Ile Leu Lys Ala Asn Ala Ala Gly Lys Asp 170 165 Lys Gly Val Glu Glu Leu Glu Lys Leu Ser Gly Ser Leu Glu Ser Leu 185 Ser Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr 200 Ser Pro Val Val His Gly Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser 215 Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile 235 230 Ser Lys Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu 250 245 Val Glu Thr Leu Leu Thr Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly 265 Lys Lys Ile Lys Asn Asp Val Ser Leu Asp Asn Glu Ala Asp His Asn 280 Gly Ser Leu Ile Ser Gly Ala Tyr Leu Ile Ser Asn Leu Ile Thr Lys 295 Lys Ile Ser Ala Ile Lys Asp Ser Gly Glu Leu Lys Ala Glu Ile Glu 315 310 Lys Ala Lys Lys Cys Ser Glu Glu Phe Thr Ala Lys Leu Lys Gly Glu 330 325 His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp Asp Asn Ala Lys Lys 345

340

### 33/202

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Ch. 4

gaa aa Glu As	it g sn A	ca a	Lys ]	aaa g Lys 2	gct Ala	att Ile	tta Leu	aaa Lys	gca Ala 170	aat Asn	gca Ala	gcg Ala	ggt Gly	aaa Lys 175	gat Asp	528
aag gg Lys Gl	gc g Ly V	al	gaa Glu 180	gaa Glu	ctt Leu	gaa Glu	aag Lys	ttg Leu 185	tcc Ser	gga Gly	tca Ser	tta Leu	gaa Glu 190	agc Ser	tta Leu	576
tca aa Ser Ly	ys A	ca la .95	gct Ala	aaa Lys	gag Glu	atg Met	ctt Leu 200	gct Ala	aat Asn	tca Ser	gtt Val	aaa Lys 205		ctt Leu	aca Thr	624
	ro V 10	/al	Val	Hıs	GIY	215	ASII	261	Cly	2,2	220	- 1				672
gca a Ala A 225	at t	cct Ser	gct Ala	gat Asp	gag Glu 230	tct Ser	gtt Val	aaa Lys	Gly 999	Pro 235		ctt Leu	aca Thr	gaa Glu	ata Ile 240	720
agt a Ser L	aa a ys :	aaa Lys	att Ile	aca Thr 245	gaa Glu	tct Ser	aac Asn	gca Ala	gtt Val 250	. va.	cto Lev	g gct 1 Ala	gtg Val	aaa Lys 255	gaa Glu	768
att g	gaa Hu	act Thr	ttg Leu 260	ctt Leu	gca Ala	tct Ser	ata Ile	gat Asp 265	GIL	t ctt	gct Ala	act a Thi	aaa Lys 270	gct Ala	att lle	816
ggt a Gly I	Ьys	aaa Lys 275	ata Ile	caa Gln	caa Gln	aat Asn	ggt Gly 280	GIY	tta Lei	a gci	t gte a Va	c gaa 1 Gl: 28	a gcg u Ala 5	g 999 a Gly	g cat / His	864
Asn (	Gly 290	Thr	Leu	Leu	Ala	295	Alc	а тул	_ 111.		30	0			a aca e Thr	912
Gln :	Lys	Leu	Asp	о GIУ	7 Let 310	) г га	S ASI	1 56.	L GI	31	5	1	-	-	a att s Ile 320	960
Glu	Asn	Ala	Lys	325	s Cys	s se	r Gi	u As	33	0	<u> </u>	J -1		33		1008
Glu	His	Ala	340	n Lei O	ı GI	A 11	e Gi	u AS 34	5	11 11		, p	35	0	a aaa a Lys	1056
Lys	Ala	110 35	e Lei 5	u II	e Tn	r AS	36	0	а <b>ப</b> ј	, 5 11.	JP	3 6	55		a gag a Glu	1104
ctt Leu	gaa Glu 370	Ly	g ct s Le	a tt u Ph	t aa e Ly	a go s Al 37	a vo	a ga il Gl	ia aa .u As	ac ti sn Le		ca aa la Ly 80	aa go ys Al	ca go la Al	et aaa la Lys	
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t.t

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th t

Ser	Lys	Ala 195	Ala	Lys	gag Glu	мес	200	Ala	ASII	JCI	•442	205				624
Ser	Pro 210	Val	Val	His		Asn 215	Asn	ser	Arg	пуъ	220	O17				672
Thr 225	Asn	Ser	Ala	Asp	gag Glu 230	ser	vaı	гуѕ	GIY	235	ADII	200			240	720
agt Ser	aaa Lys	aaa Lys	att Ile	aca Thr 245	gaa Glu	tct Ser	aac Asn	gca Ala	gtt Val 250	gtt Val	ctg Leu	gcc Ala	gtg Val	aaa Lys 255	gaa Glu	768
gtt Val	gag Glu	acc Thr	tta Leu 260	ctt Leu	gca Ala	tct Ser	ata Ile	gat Asp 265	gaa Glu	ctt Leu	gct Ala	acc Thr	aaa Lys 270	gct Ala	att Ile	816
ggt Gly	aag Lys	aaa Lys 275	ata Ile	ggc Gly	aat Asn	aat Asn	ggt Gly 280	tta Leu	gag Glu	gcc Ala	aat Asn	cag Gln 285	agt Ser	aaa Lys	aac Asn	864
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gca Ala	a gtg a Val	g cti L Lei	ggt 1 Gly 340	, Ter	g gac 1 Asp	aat Asr	ctt Lev	act Thr 345	ASF	gat Asp	aat Asi	gca n Ala	a caa a Glr 350		g gct	1056
ati Ile	t tta e Lei	a aaa 1 Ly: 35	s Ly:	a cat	: Ala	a Asi	aaa 1 Lys 360	S AS	, шya	5 GI,	y 15-1	t gca a Ala 36!		a cti u Lei	gaa 1 Glu	1104
aa Ly	g tta s Le	u Ph	t aa e Ly	a gcg s Ala	g gta a Val	a gaa l Gli 37!	1 ASI	c tta n Lei	a tca ı Sei	a aa r Ly	a gc s Al 38	u	t caa a Gl	a ga n As	c aca p Thr	1152
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Al,t

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ch.

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aaa Lys	att Ile	aca Thr	gat Asp	tct Ser 245	aat Asn	gca Ala	ttt Phe	tta Leu	ctg Leu 250	gct Ala	gtg Val	aaa Lys	gaa Glu	gtt Val 255	gag Glu	768
gct Ala	ttg Leu	ctt Leu	tca Ser 260	tct Ser	ata Ile	gat Asp	gaa Glu	ctt Leu 265	tct Ser	aaa Lys	gct Ala	att Ile	ggt Gly 270	aaa Lys	aaa Lys	816
ata Ile	aaa Lys	aat Asn 275	gat Asp	ggt Gly	act Thr	tta Leu	gat Asp 280	aac Asn	gaa Glu	gca Ala	aat Asn	cga Arg 285	aac Asn	gaa Glu	tca Ser	864
ttg Leu	ata Ile 290	gca Ala	gga Gly	gct Ala	tat Tyr	gaa Glu 295	ata Ile	tca Ser	aaa Lys	cta Leu	ata Ile 300	aca Thr	caa Gln	aaa Lys	tta Leu	912
agt Ser 305	gta Val	ttg Leu	aat Asn	tca Ser	gaa Glu 310	gaa Glu	tta Leu	aag Lys	aaa Lys	aaa Lys 315	att Ile	aaa Lys	gag Glu	gct Ala	aag Lys 320	960
Asp	Cys	Ser	Gln	Lys 325	Phe	Thr	Thr	Lys	ьеи 330	гÀг	Asp	ser	птр	335	gag Glu	1008
Leu	Gly	Ile	Gln 340	Ser	Val	Gln	Asp	345	ASII	Ala	пуъ	пуъ	350	110	tta Leu	1056
Lys	Thr	His	Gly	Thr	Lys	Asp	360	GIY	Ala	гÀг	Glu	365	GIU	Giu	tta Leu	1104
Phe	Lys 370	Ser	Leu	Glu	Ser	Leu 375	Ser	. Lys	Ala	Ala	380	)	Ald	ьeu	act Thr	1152
aat Asn 385	Ser	gtt Val	aaa Lys	gag Glu	ctt Leu 390	Thr	aat Asn	cct Pro	gtt Val	gto Val	. Ala	gaa Glu	agt Ser	cca Pro	aaa Lys 400	1200
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gat Asp	ggg Gly	aat Asn 35	gca Ala	tct Ser	gca Ala	aat Asn	tct Ser 40	gct Ala	gat Asp	gag Glu	tct Ser	gtt Val 45	aaa Lys	Gly 999	cct Pro	144
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ctg Leu 65	gcc Ala	gtg Val	aaa Lys	gaa Glu	gtt Val 70	gag Glu	acc Thr	tta Leu	ctt Leu	gca Ala 75	tct Ser	ata Ile	gat Asp	gaa Glu	ctt Leu 80	240
gct Ala	acc Thr	aaa Lys	gct Ala	att Ile 85	GТУ	aaa Lys	aaa Lys	ata Ile	ggc Gly 90	Maii	aat Asr	ggt Gly	tta Leu	gag Glu 95	gcc Ala	288
aat Asn	cag Gln	agt Ser	aaa Lys	Asn	aca Thr	tca Ser	ttg Leu	tta Leu 105	tca Ser	gga Gly	gct Ala	tat a Tyr	gca Ala 110		tct Ser	336
gac Asp	cta Leu	ata Ile	e Ala	a gaa a Glu	aaa Lys	tta Leu	aat Asn 120	vaı	ttg Leu	aaa Lys	a aat s Asi	t gaa n Glu 129		ı tta ı Lei	a aag 1 Lys	384
gaa Glu	a aag 1 Lys 130	; Ile	gat E Asj	aca Thi	gct Ala	aag Lys 135	5 G11	tgt Cys	tct Ser	aca Thi	a ga c Gl		act Thi	aat Ası	aaa n Lys	432
cta Le: 14!	ı Lys	a agt	t ga r Gl	a cat u His	gca s Ala	ı va.	g ctt L Lei	ggt Gly	cto Lei	g gad 1 Asj 15		t ct n Le	t act	t gaʻ r Asj	t gat p Asp 160	480
aa† Asi	t gca n Ala	a ca a Gl	a ag n Ar	a gc g Ala 16	a Ile	tta e Le	a aaa u Lys	a aaa s Lys	a cat s His	5 MI	a aa a As	t aa n Ly	a ga s As	t aa p Ly 17	g ggt s Gly 5	528
gc Al	t gca a Ala	a ga a Gl	a ct u Le 18	u GI	a aag u Ly	g tt: s Le	a tt u Ph	t aaa e Lya 18	2 MT.	g gt a Va	a ga 1 Gl	a aa .u As	c tt n Le 19	a tc u Se 0	a aaa r Lys	576
gc Al	a gc a Al	t ca a Gl 19	n As	c ac p Th	a tt r Le	a aa u Ly	a aa s As 20	U AT	t gt a Va	t aa l Ly	a ga s G]	ig ct Lu Le 20		a ag r Se	t cct r Pro	624
at Il	t gt e Va 21	l Hi	it gg .s Gl	gt aa .y As	t aa n As	t to n Se 21	r Gi	g aa y Ly	a ga s As	t gg p Gl	у	at ac sn Th	a to ir Se	t go r Al	a aat a Asn	672

An t

tct gct ga Ser Ala As 225	t gag t o Glu S	ct gtt Ser Val 230	aaa Lys	Gly 999	cct Pro	Asn	ctt Leu 235	aca Thr	gaa Glu	ata Ile	agt Ser	aaa Lys 240	720
aaa att ac Lys Ile Th	r Glu S	ct aac Ger Asn 245	gca Ala	gtt Val	gtt Val	ctc Leu 250	gcc Ala	gtg Val	aaa Lys	gaa Glu	gtt Val 255	gaa Glu	768
act ttg ct Thr Leu Le	t aca t u Thr S 260	ct ata Ser Ile	gat Asp	gag Glu	ctt Leu 265	gct Ala	aaa Lys	gct Ala	att Ile	ggt Gly 270	aaa Lys	aaa Lys	816
ata aaa aa Ile Lys As 27	n Asp V	gtt agt Val Ser	tta Leu	gat Asp 280	aat Asn	gag Glu	gca Ala	gat Asp	cac His 285	aac Asn	gga Gly	tca Ser	864
tta ata to Leu Ile Se 290	a gga g r Gly A	gca tat Ala Tyr	tta Leu 295	att Ile	tca Ser	aac Asn	tta Leu	ata Ile 300	aca Thr	aaa Lys	aaa Lys	ata Ile	912
agt gca at Ser Ala Il 305	a aaa g e Lys <i>P</i>	gat tca Asp Ser 310	gga Gly	gaa Glu	ttg Leu	aag Lys	gca Ala 315	gaa Glu	att Ile	gaa Glu	aag Lys	gct Ala 320	960
aag aaa to Lys Lys Cy	s Ser (	gaa gaa Glu Glu 325	ttt Phe	act Thr	gct Ala	aaa Lys 330	tta Leu	aaa Lys	ggt Gly	gaa Glu	cac His 335	aca Thr	1008
gat ctt gg Asp Leu Gl	t aaa g y Lys ( 340	gaa ggc Glu Gly	gtt Val	act Thr	gat Asp 345	gat Asp	aat Asn	gca Ala	aaa Lys	aaa Lys 350	gcc Ala	att Ile	1056
tta aaa ad Leu Lys Th 3!	r Asn A	aat gat Asn Asp	aaa Lys	act Thr 360	aag Lys	ggc Gly	gct Ala	gat Asp	gaa Glu 365	ctt Leu	gaa Glu	aag Lys	1104
tta ttt ga Leu Phe G 370	a tca q Lu Ser	gta aaa Val Lys	aac Asn 375	ttg Leu	tca Ser	aaa Lys	gca Ala	gct Ala 380	ьуs	gag Glu	atg Met	ctt Leu	1152
act aat to Thr Asn So 385	ca gtt a er Val :	aaa gag Lys Glu 390	ctt Leu	aca Thr	agc Ser		. *	•					1179
<210> 72 <211> 393 <212> PRT <213> osp	C Chime	ra											
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1 Ala Gln L		5 Ala Glu	Ser	Ile	Gly	10 Ser	Cys	Asn	Asn	Ser	15 Gly	Lys	
Asp Gly A		Ser Ala	Asn	Ser	25 Ala	Asp	Glu	Ser	Val		Gly	Pro	
Asn Leu T 50	hr Glu	Ile Ser	Lys 55		Ile	Thr	Glu	Ser 60		Ala	\Val	Val	

A), T

Leu Ala Val Lys Glu Val Glu Thr Leu Leu Ala Ser Ile Asp Glu Leu 70 Ala Thr Lys Ala Ile Gly Lys Lys Ile Gly Asn Asn Gly Leu Glu Ala 90 Asn Gln Ser Lys Asn Thr Ser Leu Leu Ser Gly Ala Tyr Ala Ile Ser 85 105 100 Asp Leu Ile Ala Glu Lys Leu Asn Val Leu Lys Asn Glu Glu Leu Lys 125 120 Glu Lys Ile Asp Thr Ala Lys Gln Cys Ser Thr Glu Phe Thr Asn Lys 140 135 Leu Lys Ser Glu His Ala Val Leu Gly Leu Asp Asn Leu Thr Asp Asp 155 150 Asn Ala Gln Arg Ala Ile Leu Lys Lys His Ala Asn Lys Asp Lys Gly 170 165 Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val Glu Asn Leu Ser Lys 185 180 Ala Ala Gln Asp Thr Leu Lys Asn Ala Val Lys Glu Leu Thr Ser Pro 200 Ile Val His Gly Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn 220 215 Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys 235 230 Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Val Glu 250 245 Thr Leu Leu Thr Ser Ile Asp Glu Leu Ala Lys Ala Ile Gly Lys Lys 265 260 Ile Lys Asn Asp Val Ser Leu Asp Asn Glu Ala Asp His Asn Gly Ser 285 280 Leu Ile Ser Gly Ala Tyr Leu Ile Ser Asn Leu Ile Thr Lys Lys Ile 300 295 Ser Ala Ile Lys Asp Ser Gly Glu Leu Lys Ala Glu Ile Glu Lys Ala 315 310 Lys Lys Cys Ser Glu Glu Phe Thr Ala Lys Leu Lys Gly Glu His Thr 330 325 Asp Leu Gly Lys Glu Gly Val Thr Asp Asp Asn Ala Lys Lys Ala Ile 350 345 340 Leu Lys Thr Asn Asn Asp Lys Thr Lys Gly Ala Asp Glu Leu Glu Lys 365 360 355 Leu Phe Glu Ser Val Lys Asn Leu Ser Lys Ala Ala Lys Glu Met Leu 375 Thr Asn Ser Val Lys Glu Leu Thr Ser 390 <210> 73 <211> 1178 <212> DNA <213> ospC Chimera <220> <221> CDS <222> (1)...(1178) <400> 73 atg aga tta tta ata gga ttt gct tta gcg tta gct tta ata gga tgt Met Arg Leu Leu Ile Gly Phe Ala Leu Ala Leu Ala Leu Ile Gly Cys 10 5 1

Al. t

#### 129 -85/<del>102</del>

	Gln	Lys	20 20	Ala	GIU	ser	116	25	001	. • ,	, -			30				96
gat Asp	gly ggg	aat Asn 35	gca Ala	tct Ser	gca Ala	aat Asn	tct Ser 40	gct Ala	gat Asp	g G	ag f	tct Ser	gtt Val 45	aaa Lys	Gl)	g C	ct ro	144
aat Asn	ctt Leu 50	aca Thr	gaa Glu	ata Ile	agt Ser	aaa Lys 55	aaa Lys	att Ile	aca Thi	ag rG	aa lu	tct Ser 60	aac Asn	gca Ala	gt! Va:	5 g 1 V	tt al	192
ctg Leu 65	gcc, Ala	gtg Val	aaa Lys	gaa Glu	gtt Val 70	gag Glu	acc Thr	tta Leu	ct Le	t g u A	ca la 75	tct Ser	ata Ile	gat Asp	ga Gl	a c u I	ett Jeu 80	240
gct Ala	acc Thr	aaa Lys	gct Ala	att Ile 85	ggt Gly	aaa Lys	aaa Lys	ata Ile	01	са у <i>Р</i> 0	at Asn	aat Asn	ggt Gly	tta Leu	ga Gl 9	g 9 u <i>1</i> 5	gcc Ala	288
aat Asn	cag Gln	agt Ser	aaa Lys	aac Asn	aca Thr	tca Ser	ttg Leu	tta Leu 105		a g	gga Bly	gct Ala	tat Tyr	gca Ala 110	a at a Il	a f	tct Ser	336
gac Asp	cta Leu	ata Ile	e Ala	ı gaa ı Glu	aaa Lys	tta Leu	aat Asr 120	ı val	tt L Le	g a eu l	aaa Lys	aat Asr	gaa Glu 125	gaa u Gl	a tt u Le	a eu	aag Lys	384
gaa Glu	a aag 1 Lys 130	; Ile	t gat e Asp	aca Thr	gct Ala	aag Lys 135	S GII	a tgt n Cys	t to	et e	aca Thr	gaa Glu 140		ac e Th	t aa r As	at sn	aaa Lys	432
cta Lei 14!	ı Lys	a ag	t gaa r Gli	a cat u His	gca s Ala	ı va.	g cti Le	t gg u Gl	t ci	- u	gac Asp 155		cti n Le	t ac u Th	t ga	at sp	gat Asp 160	480
		a ca a Gl	a ag n Ar	a gc g Al	a II	tt: e Le	a aa u Ly	a aa s Ly	5 11	at is 70	gca Ala	aa As:	t aa n Ly	a ga s As	t a p L 1	ag ys 75	ggt Gly	528
gc Al	t gc a Al	a ga a Gl	a ct u Le 18	t ga u Gl 0	a aa u Ly	g tt s Le	a tt u Ph	е пу	ם ב	La	V 44 1	ı ga L Gl		c tt n Le 19	a t eu S 90	ca er	aaa Lys	576
gc Al	a gc a Al	t ca a Gl	.n As	c ac p Th	a tt r Le	a aa u Ly	a aa s As 20	11 H	t g a V	tt al	aaa Lys	a ga s Gl	g ct u Le 20	t ac u Tl	ca a nr S	gt	cct Pro	624
at Il	t gt e Va 21	l H	at gg is Gl	gt aa Ly As	t aa n As	t to n Se 21	er G	ga aa Ly Ly	aa g /s <i>F</i>	gat Asp	ggg Gl	g aa y As 22		a te ir S	et g	ıca Ma	aat Asn	672
Se	et go er Al	et ga La A	at ga sp G.	ag to lu Se	t gt er Va 23	т гу	aa gg /s G.	gg co ly Pi	ct a	aat Asn	ct Le 23		a ga ir G	aa a lu I	ta a le s	agt Ser	aaa Lys 240	720
		t a le T	ca g hr G	lu Se	ct aa er As 45	ac go sn Al	ca g la V	tt g al V	aı.	ctg Leu 250		t gi a Va	g a	aa g ys G	aa a lu	att Ile 255	gaa Glu	768

P's.t

	act Thr	ttg Leu	ctt Leu	gca Ala 260	tct Ser	ata Ile	gat Asp	gaa Glu	ctt Leu 265	gct Ala	act Thr	aaa Lys	gct Ala	att Ile 270	ggt Gly	aaa Lys	816
	aaa Lys	ata Ile	caa Gln 275	caa Gln	aat Asn	ggt Gly	ggt Gly	tta Leu 280	gct Ala	gtc Val	gaa Glu	gcg Ala	999 Gly 285	cat His	aat Asn	gga Gly	864
	aca Thr	ttg Leu 290	tta Leu	gca Ala	ggt Gly	gct Ala	tat Tyr 295	aca Thr	ata Ile	tca Ser	aaa Lys	cta Leu 300	ata Ile	aca Thr	caa Gln	aaa Lys	912
	tta Leu 305	gat Asp	gga Gly	ttg Leu	aaa Lys	aat Asn 310	tca Ser	gaa Glu	aaa Lys	tta Leu	aag Lys 315	gaa Glu	aaa Lys	att Ile	gaa Glu	aat Asn 320	960
•	gct Ala	aag Lys	aaa Lys	tgt Cys	tct Ser 325	gaa Glu	gat Asp	ttt Phe	act Thr	aaa Lys 330	aaa Lys	cta Leu	gaa Glu	gga Gly	gaa Glu 335	cat His	1008
	gcg Ala	caa Gln	ctt Leu	gga Gly 340	att Ile	gaa Glu	aat Asn	gtt Val	act Thr 345	gat Asp	gag Glu	aat Asn	gca Ala	aaa Lys 350	aaa Lys	gct Ala	1056
	att Ile	tta Leu	ata Ile 355	aca Thr	gat Asp	gca Ala	gct Ala	aaa Lys 360	gat Asp	aag Lys	ggc Gly	gct Ala	gca Ala 365	gag Glu	ctt Leu	gaa Glu	1104
	aag Lys	cta Leu 370	ttt Phe	aaa Lys	gca Ala	gta Val	gaa Glu 375	aac Asn	ttg Leu	gca Ala	aaa Lys	gca Ala 380	gct Ala	aaa Lys	gag Glu	atg Met	1152
	ctt Leu 385	gct Ala	aat Asn	tca Ser	gtt Val	aaa Lys 390	gag Glu	ctt Leu	ac								1178
	<21 <21	0> 7 1> 3 2> P 3> 0	92 RT	Chim	era												
	<40	0> 7	4							_	_		_	<b>-</b> 1.	<b>01</b> -		
	1				5					10					12	Cys	
	Ala	Gln	Lys	Gly 20	Ala	Glu	Ser	Ile	Gly 25	Ser	Cys	Asn	Asn	Ser 30	Gly	Lys	
	Asp	Gly		Ala	Ser	Ala	Asn	Ser 40		Asp	Glu	. Ser	Val	Lys	Gly	Pro	
	Asn		35 Thr	Glu	ılle	Ser			Ile	Thr	Glu	Ser 60		Ala	val	Val	
		50 Ala	Val	. Lys	Glu		55 . Glu	Thr	Leu	Lev	Ala 75		: Ile	Asp	Glu	Leu 80	
	65 Ala	Thr	Lys	. Ala		70 e Gl	, Lys	Lys	Ile	gly		n Asr	ı Gly	Leu	ı Glı 95	ı Ala	
	Asn	Gln	Ser	Lys 100		ı Thı	Ser	Leu	Leu 105	90 Ser	: Gly	/ Ala	а Туг	Ala 110	Ile	e Ser	

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### 13 1 -87/102

									- ,							
Asp	Leu	Ile	Ala	Glu	Lys	Leu	Asn	Val	Leu	Lys	Asn	Glu 125	Glu	Leu	Lys	
Glu	Lys	115 Ile	Asp	Thr	Ala	Lys	Gln	Cys	Ser	Thr	Glu 140	Phe	Thr	Asn	Lys	
Leu	130 Lys	Ser	Glu	His	Ala	135 Val	Leu	Gly	Leu	Asp	Asn	Leu	Thr	Asp	Asp 160	
	Ala															
	Ala															
	Ala															
Ile	Val 210	His	Gly	Asn	Asn	Ser 215	GIY	ьуѕ	Asp	- Gry	220	<i>a</i> 1	T10	Cor	Asn	
Ser	Ala	Asp	Glu	Ser	Val 230	Lys	Gly	Pro	Asn	Leu 235	Thr	Glu	116	261	Lys 240	
					Asn	Ala									Glu	
Thr	Leu	Leu	Ala	245 Ser	Ile	Asp	Glu	Leu	Ala	Thr	. Lys	Ala	11e 270	Gly	Lys	
Lvs	Ile	Gln	260 Gln	Asn	Gly	Gly	Leu	265 Ala	Val	Glu	Ala	Gly	His	Asn	Gly	
mba	· [ ]	275	λla	Glv	Ala	Tyr	280 Thr	Ile	Ser	Lys	Lev	285 Ile	Thr	Glr	Lys	
1111	290	, <u>1</u> 100			) Acr	295 Ser	Gl11	Lvs	Leu	Lys	300 Glu	) ı Lys	Ile	. Gli	Asn 320	
Let 305	ı Asp	GIY	ьeu	гру	310		Dh.		· T.v.c	315	Lei	ı Glı	ı Glv	, Gli	320 His	
															Ala	
			Thi	Asp											ı Glu	
Ly	s Lei	35! 2 Phe	o e Lys	s Ala	a Vai	l Glu	ı Asr	Let	ı Ala	а Гу	s Ala 38	a Ala O	a Lys	s Gl	ı Met	
Le	370 u Ala	) a Asi	n Sei	r Va	l Ly:	37! Gl:		ı				-				
38					39											
_																
<2	10> 11>	1178														
<2 <2	12> 1 13>	DNA ospC	Chi	mera												
	20>															
<2	21>	CDS	(1	178)												
	:00> :g ag		a tt	a at	a gg	a tt	t go	t tt	a go	g tt	a go	t tt	a at	a gg	a tgt y Cys	; 48 ;
M∈	t Ar	g Le	u Le	u Il 5	e GI	y Ph	ie Al	аье	u Aı	.0	u Aı	a De		1	y Cys .5	
		a aa	a go	rt. ac	t qa	ıq to	a at	t gg	ga to	c to	gt aa	at aa	at to	a gg	ga aaa Ly Lys	a 96
A]	la Gl	n Ly	/s Gl	y Al 20	a Ğl	ū Se	er Il	.6 61	.y Se 25	er Cy	/s As	sn As		er G. 30	Гу Гуз	i
							·+ +-	+ a	rt as	at ø	aa ta	ct at	t aa	aa go	gg cct lv Pro	144
ga 'As	at gg sp Gl	Ly As	sn A.	ca to la Se	er Al	a aa la As	sn Se	er A.	la As	sp G	lu Se	v.	al Ly 45	ys G	ly Pro	<b>o</b>
	_		35				4	10				•				

A) cont

Asn	Leu 50	Thr	Glu	He	agt Ser	ьуs 55	БУБ	110				60							192
ctg Leu 65	gcc Ala	gtg Val	aaa Lys	gaa Glu	gtt Val 70	gag Glu	acc Thr	tta Leu	ct Le	t g u A	gca Ala 75	tct Ser	ata Ile	ga As	it (	gaa Glu	ct Le	t u 30	240
	acc Thr	aaa Lys	gct Ala	att Ile	ggt Gly	aaa Lys	aaa Lys	ata Ile	-	gc a Ly <i>I</i> 90	aat Asn	aat Asn	ggt	tt Le	eu	gag Glu 95	gc Al	cc La	288
aat Asn	cag Gln	agt Ser	aaa Lys	Asr	aca Thr	tca Ser	ttg Leu	tta Leu 105		ca (	gga Gly	gct Ala	tat Tyi	9 A	ca la 10	ata Ile	to Se	ct er	336
gac Asp	cta Leu	ata   Ile	gca Ala		a aaa 1 Lys	tta Leu	aat Asr 120	ı va.	a ti	tg eu	aaa Lys	aat Asn	gaa Gli 12	ag ıG	aa lu	tta Leu	a L	ag ys	384
gaa Glu	Lys	ati		t ac	a gct r Ala	: aag Lys	6 611	a tgʻ n Cy	t t s S	ct er	aca Thr	gaa Glu 140	tt Ph	t a e T	ct hr	aat Asn	a L	aa ys	432
Let	і ГА		t ga r Gl	a ca u Hi	t gca s Ala 150	ı va.	g cti	t gg u Gl	t c y L	tg Leu	gac Asp 155		ct Le	t a u T	ct hr	gat Asp	; g	at sp .60	480
145 aat Asi		a ca a Gl	a ag n Ar	a go g Al 16	t at a Il		a aa u Ly	a aa s Ly	J 1	cat His	gca Ala	aat Asi	t aa n Ly	a g	gat Asp	aag Lys 17	g 9 s 6	ggt Bly	528
gc Al	t gc a Al	a ga a Gl	a ct u Le	t ga u Gl	a aa u Ly	g tt s Le	a tt u Ph	t aa e Ly 18	5 1	gcg Ala	gta Va]	a ga L Gl	a aa u As	ic i	tta Leu 190	tc: Se:	a a r I	aaa Lys	576
gc Al	a gc a Al	t ca a Gl	n A	ac ac sp Th	a tt ir Le	a aa u Ly	a aa s As 20	11 71-	et q	gtt Val	aaa Ly:	a ga s Gl	g c1 u Le 2	eu 05	aca Thr	ag Se	t (	cct Pro	624
at Il	t gt e Va	c ca		gt aa ly A	at aa sn As	it to sn Se 21	I AI	ga aa cg Li	aa ys	gat Asp	gg Gl	g aa y As 22	_	ca la	tct Sei	ac Th	a	aat Asn	672
to Se	et go		at g sp G	ag t lu S	ct gt er Va 21	t aa al Ly 30	aa gg ys G	gg c ly P	ct ro	aat Asn	ct Le 23	-	a g ir G	aa lu	ata Ile	a ag e Se	jt er	aaa Lys 240	720
		tt a le T	ca 9 hr G	Iu S	ct a er A 45	ac g sn A	ca g la V	tt g al V	tt al	cto Lev 250		c gt a Va	g a al I	aa ys	ga Gl	agt uVa 25	al 55	gag Glu	768
a T	cc t hr L	ta c eu L	eu P	jca t la S 260	ct a er I	ta g le A	at g sp G	Tu I	tt eu 65	gct Ala	t ac a Th	c a	aa g ys <i>l</i>	ıct la	at Il 27	t gg e G	gt ly	aag Lys	816

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aaa Lys	ata Ile	ggc Gly 275	aat Asn	aat Asn	ggt Gly	tta Leu	gag Glu 280	gcc Ala	aat Asn	cag Gln	agt Ser	aaa Lys 285	aac Asn	aca Thr	tca Ser	864
ttg Leu	tta Leu 290	tca Ser	gga Gly	gct Ala	tat Tyr	gca Ala 295	ata Ile	tct Ser	gac Asp	cta Leu	ata Ile 300	gca Ala	gaa Glu	aaa Lys	tta Leu	912
aat Asn 305	gta Val	ttg Leu	aaa Lys	aat Asn	gaa Glu 310	gaa Glu	tta Leu	aag Lys	gaa Glu	aag Lys 315	att Ile	gat Asp	aca Thr	gct Ala	aag Lys 320	960
caa Gln	tgt Cys	tct Ser	aca Thr	gaa Glu 325	ttt Phe	act Thr	aat Asn	aaa Lys	cta Leu 330	aaa Lys	agt Ser	gaa Glu	cat His	gca Ala 335	gtg Val	1008
ctt Leu	ggt Gly	ctg Leu	gac Asp 340	aat Asn	ctt Leu	act Thr	gat Asp	gat Asp 345	aat Asn	gca Ala	caa Gln	aga Arg	gct Ala 350	att Ile	tta Leu	1056
aaa Lys	aaa Lys	cat His 355	Ala	aat Asn	aaa Lys	gat Asp	aag Lys 360	ggt Gly	gct Ala	gca Ala	gaa Glu	ctt Leu 365	gaa Glu	aag Lys	tta Leu	1104
ttt Phe	aaa Lys 370	Ala	gta Val	gaa Glu	aac Asn	tta Leu 375	ser	aaa Lys	gca Ala	gct Ala	caa Gln 380	_ Asp	aca Thr	tta Leu	aaa Lys	1152
aat Asn 385	Ala	gtt Val	aaa Lys	gag Glu	ctt Leu 390	Thr	agt Ser	CC								1178
<21 <21	.0 > 7 .1 > 3 .2 > F	92 PRT	Chim	nera												
<4(	0> 7	76 7 J.A.	1 T.e1	1 Tle	• G] v	, Phe	a Ala	. Lev	ı Ala	ı Let	ı Ala	a Leu	ı Ile	e Gly	/ Cys	
									10				sei	1. 0	/ Lys	
			20					7.7				r Val			y Pro	
		2 5					4()				ı Se:	ェン			l Val	
						- 5				ı Ala	00				u Leu 80	
				a Ile	70				e Gl	13					u Ala	
As	n Gl	n Se			n Th	r Se	r Le	u Le:	90 u Se: 5	r Gl	y Al	а Ту	r Ala	a Il	e Ser	
		11	_	a Gl			12	n Val	l Le			14	u Gl <sup>.</sup> 5	u Le	u Lys	
		^	e As			73	s Gl:	n Cy			7.4	u Ph 0	e Th		n Lys	
Le 14		s Se	r Gl	u Hi	s Al 15	a Va	l Le	u Gl	y Le	u As 15	p As 5	n Le	u Th	r As	p Asp 160	

90/102	
LVS ASP D	
Asn Ala Glu Arg Ala Ile Leu Lys Lys His Ala Asn Leu Ser Lys 170 170 180 180 180 180 180 180 180 180 180 18	
The Leu Lys Lys 170 and Asn Leu Ser 27	
Asn Ala Gln Arg Ala 11e Lev Phe Lys Ala Val Glu Asn 190  Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val Lys Glu Leu Thr Ser Pro  180  Ala Ala Gln Asp Thr Leu Lys Asn Ala Val Lys Glu Leu Thr Asn  200  Ala Ala Gln Asp Thr Leu Lys Asn Asn Ser Arg Lys Asp Gly Asn Ala Ser Thr Asn  220  195  Cly Asn Asn Ser Arg Lys Asp Gly Thr Glu Ile Ser Lys  240	
Asn Ala 165 Leu Phe 175 Clu Leu Thr Sei 175	
ala Glu Leu Glu By	
Ala Ala Ser Till Lys Ash Ala Ser Till Ann Ala Ser Till An	
alo Gln Asp Thi Bot 200 Lys Asp Gly Ash 1	
Ala Ala 195 Asn Ser Arg By Br Glu Ile Sel 240	
Ala Ala Glu Leu Glu Lys Asn Ala Val Lys Glu 205  Ala Ala Gln Asp Thr Leu Lys Asn Ala Val Lys Glu 205  Ala Ala Gln Asp Thr Leu Lys Asn Ala Ser Thr Asn  200  Ala Ala Gln Asp Thr Leu Lys Asp Gly Asn Ala Ser Thr Asn  210  Clu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys  220  220  220  220  240  235  210  Clu Ser Val Lys Gly Pro Asn Leu Thr Glu Val Glu  235	
ile val Lys Gly Flo 235 yel Lys Glu Val est	
210 ASD Glu Ser 230 . Wal Leu Ala Val 2 25	
Ala Ala Gln Asp Thr Let 200  Asp Gly Asp Gly Asp Gly Asp Gly Ite Ser Lys  195  11e Val His Gly Asn Asn Ser Arg Lys Asp Gly Ite Ser Lys 220  2210  Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ite Ser Lys 235  225  225  Lys Ite Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Gly Lys 245  Lys Ite Asp Glu Leu Ala Thr Lys Ala Ite Gly Lys 265  265  265  Cln Ser Lys Asn Thr Ser	
225 The Thr Glu Ser Assaulten Ala Thr Lys 270 mbr Ser	
Lys lie 12 245 Giu accr Lys Asn Thi	
Ser Ala Asp Glu Ser Val 27  Ser Ala Asp Glu Ser Asn Ala Val Val Leu Ala Val Lys 255  Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala Thr Lys Ala Ile Gly Lys  Lys Ile Thr Glu Ser Asn Ala Val Leu Ala Thr Lys Ala Ile Gly Lys  Thr Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Asn Thr Ser  265  Lys Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser  285  Lys Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ser  285  Lys Ile Gly Asn Asn Gly Leu Glu Ala Asn Gln Ser Lys Asn Thr Ala Lys  300  Leu Leu Ser Gly Ala Tyr Ala Ile Ser Asp Leu Ile Asp Thr Ala Lys  290  Lys Asn Glu Glu Leu Lys Glu Lys Ile Asp Thr Ala Val  290  Lys Asn Glu Glu Leu Lys Glu Lys Ser Glu His Ala Val	
Thr Lea 260 and Gly Leu Gly Leu Gly Leu Gly Lie Ala Glu Lys	
Tie Gly Asn Ash Car Asp Leu 110	
Lys 11e Asp Thr Ala 320	
You Ser Gly Ala 295 Lys Glu Lys II	
Leu Leu Sei 31 290 315 315 315 315 335 335 335 335 335 335	
V 12 Leu Lys Ash 310 Lys Leu Lys Scar 316 Leu	
Lys Ile Gly Asn Asn Gly 280  280  280  280  280  280  280  280	
305 Ser Thr Glu Asp Asn Ala 350 Lvs Leu	
Leu Leu Ser Gly Ala Tyl 295  Leu Leu Ser Gly Ala Tyl 295  Asn Val Leu Lys Asn Glu Glu Leu Lys Glu Lys Ile Asr 315  Asn Val Leu Lys Asn Glu Glu Leu Lys Ser Glu His Ala Val  335  Asn Val Leu Lys Asn Lys Leu Lys Ser Glu His Ala Val  335  336  337  338  345  345  348  348  349  340  340  340  340  341  345	
Type Gly Ala Ala 365 The Leu Lys	
Asn Val Leu Lys Asn Glu 310  Asn Val Leu Lys Asn Glu 310  305  Gln Cys Ser Thr Glu Phe Thr Asn Lys Leu Lys Ser Glu 335  Gln Cys Ser Thr Glu Phe Thr Asn Asn Ala Gln Arg Ala Ile Leu  325  325  340  Leu Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Glu Leu Glu Lys Leu  340  Leu Gly Leu Asp Asn Lys Asp Lys Gly Ala Ala Glu Leu Lys  365  360  310  310  311  310  311  310  310	
Gln Cys Ser Thr Glu Phe 325  Gln Cys Ser Thr Glu Phe 325  Leu Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Gln Asp 350  Leu Gly Leu Asp Asn Leu Thr Asp Asp Asn Ala Glu Leu Glu Lys Leu 340  Lys Lys His Ala Asn Lys Asp Lys Gly Ala Ala Gln Asp Thr Leu Lys 360  Lys Lys Ala Val Glu Asn Leu Ser Lys Ala Ala Gln Asp Thr Leu Lys 375  Phe Lys Ala Val Glu Asn Leu Thr Ser	
355 val Glu Asn Leu	
phe Lys Ala Val Grand Ser 375 370 Asn Ala Val Lys Glu Leu Thr Ser 390	
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<pre> &lt;220&gt; &lt;221&gt; CDS &lt;222&gt; (1)(1230)  &lt;222&gt; (1)(1230)  <a href="#page-123"> </a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></pre>	

gct gct aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat 288 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gin Aan Aan Gly Leu Asp 90 95  acc gaa tat aat cac aat gga tca ttg tta gcg gga gct tat gca ata Thr Glu Tyr Aan His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile 100 100 100 100 100 100 100 100 100 10		ctt gct gtg aaa gag gtt gaa gcg ttg ctg tca tct ata gat gaa att 240 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 65 70 75
tca acc cta ata asa caa asa tta gat gga ttg asa gag gga tta 384  ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu 115  aag gaa asa att gat gcg gct asa asa tgat gga aca ttt act ast Lys Glu Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn 130  aaa tta asa gaa asa cac aca gat ctt ggt asa gas ggt gtt act gat Lys Lys Glu Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp 145  gct gat gca asa gas gcc att tta asa aca sat ggt act asa act asa Ala Asp Ala Lys Glu Ala Ile Leu Lys Thr Asn Gly Thr Lys Thr Lys 175  ggt gct gaa gaa ctt gga asa tt ttt gaa tca gat ggt gtt gcc asa gat gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Clu Val Leu Ser 185  ggt gct gaa gaa gtt ggt asa tta ttt gaa tca gta gag gtt ttg tca gly Ala Ala Ile Leu Ala Asn Ser Val Lys Glu Leu Thr Ser 195  cct gtt gtg gca gaa agt cca asa aca ctt cat ggt asa ast tca gt grad act act agt grad act asa gag gtt gt gcd gad gat gct gcd gad gat gct gcd gad gat gct gcd act gcd act act ggt ast act act gcd grad gad gt gct gcd gad gat gct gcd gcd gad gat gct gcd		gct gct aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat 288 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp 90 95
aag gaa aaa att gat gat geg get aag aaa ttt tet gaa aaa gag get tet get aaa aac att ta at gat lys Luy Silu Lys His Thr Asp Leu Gly Lys Glu Cys His Thr Asp Leu Gly Lys Glu Glu Glu Lys His Thr Asp Leu Gly Lys Glu Glu Glu Val Thr Asp Leu Gly Lys Glu Glu Glu Lys His Thr Asp Leu Gly Lys Glu Glu Val Thr Asp Leu Gly Lys Glu Glu Glu Val Thr Asp Leu Gly Lys Glu Glu Glu Val Thr Asp Leu Gly Lys Glu Glu Glu Val Thr Asp Leu Gly Lys Thr Asp Gly Thr Lys Thr Lys 175  get gat gca aaa gaa cct gga aaa tta tta gaa aca aat gat gat get gct gaa gag ctt gca aaa gag get ttg tca Gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser 190  aaa gca gca aaa gag atg ctt gct aat ta ggt aaa gag ctt aca agc Lys Ala Ala Lys Glu Met Leu Ala Asp Ser Val Lys Glu Leu Thr Ser 200  cct gtt gtg gca gaa agt cca aaa aaa cct ttc cat ggt aat aat tca Pro Val Val Ala Glu Ser Pro Lys Lys Pro Phe His Gly Asp Asp Asp Ser Ala Ser Thr Asp Pro Asp Glu Ser Ala Lys Gly Pro 225  aat ctt aca gta ata agc aaa aa aa att aca gat tct aat gat tta Asp Nan Asp Ser Asp Ala Phe Leu 250  ctg gct gtg gaa gaa gtt gag gat ttg ctt ta tct att gat asp Glu Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asp Ala Phe Leu 250  ctg gct gtg aaa gaa gtt gag gct ttg ctt ta tct att gat gas ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 270  ctc aaa gct att ggt aaa aaa aaa aaa aat aaa aat gat g		Thr Glu Tyr Ash His Ash 517 105
aaa tta aaa gaa aaa cac aca gat ctt ggt aaa gad ggt gtt act gat Lys Leu Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp 160  gct gat gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa Alaa Asp Ala Lys Glu Ala Ile Leu Lys Thr Ash Gly Thr Lys Thr Lys 175  ggt gct gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca Gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser 185  aaa gca gct aaa gag agt ctt gca aat tca gtt aaa gag gtc ttg tca 185  aaa gca gct aaa gag agt ctt gca aat tca gtt aaa gag ctt aca aac cac acc acc acc gly Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser 205  cct gtt gtg gca gaa agt cca aaa aaa cct ttc cat ggt aat aat tca Pro Val Val Ala Glu Ser Pro Lys Lys Pro Phe His Gly Asn Asn Ser 200  ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa gga cct gcly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys Gly pro 240  aat ctt acc gta at agc aaa aaa att aca gat tct aat gca ttt tta Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu 255  ctg gct gcg gaa gaa gat gag gct ttg ctt tca tct at gat gad ctt Leu Ala Val Lys Glu Val Glu Ala Lys Gly Pro 265  ctg gct gcg aaa gaa gat gag gct ttg ctt tca tct at gat gad ctt ta Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu 265  ctg gct gcg aaa gaa gat gag gct ttg ctt tca tct at gat gad ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 270  ctg gct gcg aaa gaa gat gag gct ttg ctt tca tct at gat gad ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 270  gaa gca aat cga aac gaa caa aaa at aaa aat gad ggt act tta gat aac Asa Cac Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu Asp Asn 285  gaa gca aat cga aac gaa cac tct gat gad gct tat gaa at tca Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser Ser Ile Asp Glu Ala Asn Arg Asn Glu Ser Leu Ile Ile Ala Gly Ala Tyr Glu Ile Ser Ser Ile Clu Ile Ala Cly Ala Tyr Glu Ile Ser Ser Ile Asp Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr		Ser Thr Leu 11e Lys Gin 2/5 125
Lys Leu Lys Glu Lys Glu 155 155 160  145 2145 2150 155 155 160  145 2145 2150 155 150 150  146 2150 155 150 150  147 2145 2150 150 150 150 150 150 150 150 150 150		Lys Glu Lys Tie Asp Ala 135
ggt ggct gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca flav leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser 180  aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag ctt aca agc 195 Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser 200  cct gtt gtg gca gaa agt cca aaa aaa cct ttc cat ggt aat tca gtt aca agc 205 lys Ala Ala Glu Ser Pro Lys Lys Pro Phe His Gly Asn Asn Ser 200  ggt ggg gat tct gca tct act act cat ggt ada aat tca gtt gly Asn Asn Ser 200  ggt ggg gat tct gca tct act act cat gat gay act tgca aaa gga cct 220  ggt ggg gat tct gca tct act act cat gat gat tct gca aaa gga cct 220  ggt ggg gat tct gca tct act act cat gat gat gct gca aaa gga cct 220  ggt ggg gat tct gca ata agc aaa aaa att aca gat tct act gly Pro 235  aat ctt acc gta ata agc aaa aaa att aca gat tct aat gca ttt ta Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu 255  ctg gct gtg aaa gaa gtt gag gct ttg ctt cat ct at gat gaa ctt 255  ctg gct gtg aaa gaa gtt gag gct ttg ctt cat ct at gat gaa ctt 265  ctg act gtg aaa aaa aaa ata aaa aat gat ggt act tta gat aac 270  tct aaa gct att ggt aaa aaa aaa ata aaa aat gat ggt act tta gat acc 270  tct aaa gct att ggt aaa aaa aaa aaa aat gat ggt act tta gat aac 286  gaa gca aat cga aac gaa tca ttg at gag gct tat gaa gct tat gaa at cac 386  gaa gca aat cga acc gaa tca ttg at agc gga gct tat gaa at tca Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser 300	Al t	Lys Leu Lys Giu Lys His This This 155
aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag ctt aca agc for special sp	J	Ala Asp Ala Lys Glu Alu 110 170 175
Cct gtt gtg gca gaa agt cca aaa aaa cct ttc cat ggt aat aat tca G72  Pro Val Val Ala Glu Ser Pro Lys Lys Pro Phe His Gly Asn Asn Ser  ggt ggg ggt tct gca tct act act act cct gat gag tct gca aaa gga cct Asn Asn Pro Asp Glu Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys Gly Pro 230  aat ctt acc gta ata agc aaa aaa att aca gat tct act act ggt Asn Asn Asn Asn Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 270  ctg gct gtg aaa gca agt ggg gct ttg ctt tca tct ata gat gaa ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 270  ctc aaa gct att ggt aaa aaa ata aaa aat gat ggt act tta gat aac Ser Lys Ala Ile Gly Lys Lys Ile Ile Nash Asp Glu Thr Leu Asp Asn 285  gaa gca aat cga aac gaa ca tca ttg ata gca gga gct tat gaa ata ca Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser 295		Gly Ala Glu Glu Leu Gly 2/2 2 185
ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa gga cct Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys Gly Pro 225  aat ctt acc gta ata agc aaa aaa att aca gat tct aat gca ttt tta Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu 255  ctg gct gtg aaa gaa gtt gag gct ttg ctt tca tct ata gat gaa ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 265  ctc aaa gct att ggt aaa aaa ata aaa aat gat ggt act tta gat aac 265  ctc aaa gct att ggt aaa aaa ata aaa aat gat ggt act tta gat aac 270  ctc aaa gct att ggt aaa aaa ata aaa aat gat ggt act tta gat aac 270  gaa gca aat cga aac gaa tca ttg ata gca gga gct tat gaa ata tca Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser 300		Lys Ala Ala Lys Giu Mee 200 205
aat ctt acc gta ata agc aaa aat att aca gat tct aat gca ttt tta Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe Leu 255  ctg gct gtg aaa gaa gtt gag gct ttg ctt tca tct ata gat gaa ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 265  ctt aaa gct att ggt aaa aaa aat gat ggt act tta gat acc 265  ctg gct gtg aaa gca aat ggt gag gct ttg ctt tca tct ata gat gaa ctt 265  ctg gct gtg aaa gaa gtt gag gct ttg ctt tca tct ata gat gaa ctt 270  ctc aaa gct att ggt aaa aaa aat aaa aat gat ggt act tta gat aac 286  gaa gca aat cga aac gaa tca ttg ata gca gga gct tat gaa ata tca Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser 300		Pro Val Val Ala Giu Sci 110 - 220
Asn Leu Thr val 11e 50f 275 250 255  ctg gct gtg aaa gaa gtt gag gct ttg ctt tca tct ata gat gaa ctt Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Leu 270  tct aaa gct att ggt aaa aaa ata aaa aat gat ggt act tta gat aac 864  Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu Asp Asn 285  gaa gca aat cga aac gaa tca ttg ata gca gga gct tat gaa ata tca Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser 300		Gly Gly Asp Ser Ala Ser III 235 235
tct aaa gct att ggt aaa aaa ata aaa aat gat ggt act tta gat aac  tct aaa gct att ggt aaa at aaa aat gat ggt act tta gat aac  Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu Asp Asn  285  275  gaa gca aat cga aac gaa tca ttg ata gca gga gct tat gaa ata tca  Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser  300		Asn Leu Thr val 11e 301 275 250 255
Ser Lys Ala lie Gly Lys 275  280  285  275  280  285  gaa gca aat cga aac gaa tca ttg ata gca gga gct tat gaa ata tca 912  gaa gca aat cga aac gaa tca ttg ata gca gga gct tat gaa ata tca 912  Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser  Glu Ala Asn Arg Asn Glu 295  300		Leu Ala Vai Lys Giu Vai 265
Glu Ala Asn Arg Ash Glu 295		Ser Lys Ala 11e Gly Bys 275 280
		Glu Ala Asn Arg Ash Gra 295

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aat gca aaa aaa gct att tta aaa aca cat gga act aaa gac aag ggt Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp Lys Gly 365	1104
gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg tca aaa Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu Ser Lys 370 375	1152
gca gcg caa gca gca tta act aat tca gtt aaa gag ctt aca aat cct Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr Asn Pro 395 400	1200
gtt gtg gca gaa agt cca aaa aaa cct taa Val Val Ala Glu Ser Pro Lys Lys Pro * 405  <210> 78 <211> 409 <212> PRT <213> ospC Chimera	1230
<pre>&lt;400&gt; 78 Met Arg Leu Leu Ile Gly Phe Ala Leu Ala Leu Ala Leu Ile Gly Cys 15 10 10 17 18 19 19 19 19 19 19 19 19 19 19 19 19 19</pre>	
1 5 10 10 10 10 10 10 10 10 10 10 10 10 10	
20 Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro 45	
35 Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu 55 60	
Asn Leu IIII Olu III 55	
50 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 80	
Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu 11e 75 80 65 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp	
Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu 11e  65  70  Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp  90  85  Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile	
Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile  65 70 80  65 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp  85 90 95  Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile  100 105 110  Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu	
Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile  75 80  65 70 75 80  Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp 85 90 95  Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile 100 105  Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu	L
Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile  65 70 80  65 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp  85 90 95  Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile  100 105 110  Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu	1

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	GIY	Ala	GIU	180 Lys	g1.,	Met	Len	Ala	185 Asn	Ser	Val	Lys	Glu	Leu	Thr	Sei	<b>:</b>	
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	Lуя 305	Le	u Il	e Thi	c Gli	1 Бу: 31(	)		- C.	. Cai	315	i LV:	s Phe	Th	r Th	r Ly	/S	
	Lys	ь Гу	s Il	e Ly	s Gl: 32	u Ala 5	a Lys	s As	p Cys	330	)	. <u></u>	170	. G1·	33 n As	5 n As	σε	
	Lei	ي Ly	s As	p Se	r Hi	s Ala	a Gl	u Le	u Gl 34	y Ile 5	e Gli	n se	r va.	35	0		1 5 7	
	As	n Al	a Ly	34 s Ly	o s Al	a Il	e Le	u Ly	s Th	r Hi	s Gl	y Th	r Ly:	s As 5	р гу	s G	гÀ	
	ר ת	a I.v.	35 s Gl	ob u Le	u Gl	u Gl	u Le	u Ph	e Ly	s Se	r Le	u Gl	น Se: ก	r Le	u Se	er L	уъ	
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	_	400>	> 79							L - ~	-a +	ta o	rct t	ta a	ta o	gga	tgt	48
	a	tg a	aga t	ta t Leu I	ta a	ita g Te G	ga t Ny F	tt g he A	ıct t Ma I	ta 9 eu A	la L	eu A	la L	eu I	le (	3ly	Cys	
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	ç I	gat Asp	ggg Gly	aat Asn	Thr	Ser i	Ala	Asn	Ser 2	Ala A	Asp (	3lu	Ser \	/al : 45	ьуs	СТА	PIO	
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ctt gct gtg aaa gag gtt gaa gcg ttg ctg tca tct ata gat gaa att 240 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 70 75 80
gct gct aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat 288  gct gct aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat 288  Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp  90  95
acc gaa tat aat cac aat gga tca ttg tta gcg gga gct tat gca ata 336  Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile  100  100
tca acc cta ata aaa caa aaa tta gat gga ttg aaa aat gaa gga tta 384  Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu  125  115
aag gaa aaa att gat gcg gct aag aaa tgt tct gaa aca ttt act aat 432 Lys Glu Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn 135 140
aaa tta aaa gaa aaa cac aca gat ctt ggt aaa gaa ggt gtt act gat 480  Lys Leu Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp  150  150  150
gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 528  gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 528  Ala Asp Ala Lys Glu Ala Ile Leu Lys Thr Asn Gly Thr Lys Thr Lys  175  165
ggt gct gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca 576 Gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser 180 185
aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag ctt aca agc 624  Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser  200 205
cct gtt gtg gca gaa agt cca aaa aaa cct tcc atg gta aat aat tca 672  Pro Val Val Ala Glu Ser Pro Lys Lys Pro Ser Met Val Asn Asn Ser  210 210 210
ggg aaa gat ggg aat aca tct gca aat tct gct gat gag tct gtt aaa 720 Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys 230 235 240
ggg cct aat ctt aca gaa ata agt aaa aaa att aca gaa tct aac gca 766 Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn Ala 255 245
gtt gtt ctc gcc gtg aaa gaa gtt gaa act ttg ctt aca tct ata gat 816 Val Val Leu Ala Val Lys Glu Val Glu Thr Leu Leu Thr Ser Ile Asp 260 265 270
gag ctt gct aaa gct att ggt aaa aaa ata aaa aac gat gtt agt tta 864 Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Val Ser Leu 275 280 285
gat aat gag gca gat cac aac gga tca tta ata tca gga gca tat tta 912 Asp Asn Glu Ala Asp His Asn Gly Ser Leu Ile Ser Gly Ala Tyr Leu 290 295 300

att tca aac tta ata aca aaa ata agt gca ata aaa gat tca gga  11e Ser Asn Leu Ile Thr Lys Lys Ile Ser Ala Ile Lys Asp Ser Gly 310 310 310 310	008
gaa ttg aag gca gaa att gaa aag gct aag aaa tgt tct gaa gdd oo glu Leu Lys Ala Glu Ile Glu Lys Ala Lys Lys Cys Ser Glu Glu Phe 330	J <b>0</b> 8
act gct aaa tta aaa ggt gaa cac aca gat ctt ggt aaa gaa ggc gtt 1 Thr Ala Lys Leu Lys Gly Glu His Thr Asp Leu Gly Lys Glu Gly Val 345	056
act gat gat aat gca aaa aaa gcc att tta aaa aca aat aat gat aaa I Thr Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr Asn Asn Asp Lys 360	104
act aag ggc gct gat gaa ctt gaa aag tta ttt gaa tca gta aaa aac act aag ggc gct gat gaa ctt gaa tca gta aaa aac act aag ggc gct gat gaa ctt gaa aag tta ttt gaa tca gta aaa aac act aag ggc gct gat gaa ctt gaa aag tta ttt gaa tca gta aaa aac act aag ggc gct gat aaa aac act aag ggc ggc gaa aag tta ttt gaa tca gta aaa aac act aag ggc gat gaa aag tta ttt gaa tca gta aaa aac act aag ggc gct gat gaa tca gta aaa aac act aag tta ttt gaa tca gta aaa aac act aag ggc gct gat gaa tca gta aaa aac act aag tta ttt gaa tca gta aaa aac act aag ggc gct gat gaa ctt gaa aag tta ttt gaa tca gta aaa aac act aag ggc gct gat gaa ctt gaa aag tta ttt gaa tca gta aaa aac act aact a	1152
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385	1209
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1 Ala Gly Ala Glu Ser Ile Gly Ser Cys Ash Ash 30	
Gly Agn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Bys 3-1	
Asp GIV Ash The 40 35 Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu 60 55	
Asn Leu Thr Glu Tle 55 50 50 50 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 80 75 76 77 78 78 78 79 79 70 70 70 70 70 70 70 70 70	
Leu Ala Val Lys Glu Val 575  70  65  Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp 90  85  87  Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp	
Ala Ala Lys Ala Ile Giy Lys Lys 190 85 90 Ala Gly Ala Tyr Ala Ile	
Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile  100  100  100  100  100  100  100  1	
Thr Glu lyl Ash 105 100 Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu 125 120 Ser Clu Thr Phe Thr Asn	
120.  115  Lys Glu Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn  135  140  135  140  135  140  135  140  135	
130 Clu Lys His Thr Asp Leu Gly Lys Glu Gly 160	
Lys Leu Lys Glu 275  150  145  Ala Asp Ala Lys Glu Ala Ile Leu Lys Thr Asn Gly Thr Lys 175  165	

en't

#### 140 96/102

	Gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser  190 185 185 180 180 180 180 180 180 180 180 180 180	
	Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Heu Ind	
	195 Lys Pro Ser Met Val Ash 1250	
	210 210 Asn Thr Ser Ala Asn Ser Ala Asp Giu Scr 122 240	
	225 Lys Lys Ile Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Lys 255	
	Val Val Leu Ala Val Lys Glu Val Glu Thr Leu Leu Thr Ser Ile Asp  245  Val Val Leu Ala Val Lys Glu Val Glu Thr Leu Leu Thr Ser Ile Asp  270  265  265	
	Glu Leu Ala Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Val Ser Leu 280 285 280 285 287 288	
	280 275 Asp Asn Glu Ala Asp His Asn Gly Ser Leu Ile Ser Gly Ala Tyr Leu 300 295 300 295	
	Asp Ash Giu Ala Asp 1295 295 290 295 Ile Ser Ash Leu Ile Thr Lys Lys Ile Ser Ala Ile Lys Asp Ser Gly 320 310 310 310 310 300 320 320	
Α\ ,	310 305 Glu Leu Lys Ala Glu Ile Glu Lys Ala Lys Lys Cys Ser Glu Glu Phe 335 330 330 330 330 330 330 330 330 330	
1.7	Glu Leu Lys Ala Glu 1330 325 Thr Ala Lys Leu Lys Gly Glu His Thr Asp Leu Gly Lys Glu Gly Val 345 345 340 340 340 340 340 340 340 340	
Ωr,	Thr Ala Lys Leu Lys Gly 345 340 345 Thr Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr Asn Asn Asp Lys 365 360 360 365 360 367 368	
	Thr Asp Asp Ash Ala Bys 375  360  355  Thr Lys Gly Ala Asp Glu Leu Glu Lys Leu Phe Glu Ser Val Lys Asn  380  375  380	
	Thr Lys Gly Ala Asp Gld 200 380 375 370 Leu Ser Lys Ala Ala Lys Glu Met Leu Thr Asn Ser Val Lys Glu Leu 390 395	
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	hat not part to a god add	96
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	Asp Gly Ash Till Sel All 40	100
	aat ctt aca gaa ata agt aaa aaa att acg gat tct aat gcg gtt tta Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu 55	192
	Asn Leu Thr Glu Ile Ser Lys Lys IIc III 60	

#### 14/ \_97/<del>102</del>

247242	
ctt gct gtg aaa gag gtt gaa gcg ttg ctg tca tct ata gat gaa att 240 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 75	
gct gct aaa gct att ggt aaa aaa ata cac caa aat aat ggt ttg gat 288 Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp 90 95	
acc gaa tat aat cac aat gga tca ttg tta gcg gga gct tat gca ata 336 Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile 110	
tca acc cta ata aaa caa aaa tta gat gga ttg aaa aat gaa gga tta 384  Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu  120	
aag gaa aaa att gat gcg gct aag aaa tgt tct gaa aca ttt act aat 432 Lys Glu Lys Ile Asp Ala Ala Lys Lys Cys Ser Glu Thr Phe Thr Asn 140	2
aaa tta aaa gaa aaa cac aca gat ctt ggt aaa gaa ggt gtt act gat 48 Lys Leu Lys Glu Lys His Thr Asp Leu Gly Lys Glu Gly Val Thr Asp 150 150	D
gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52 gct gat gca aaa gaa gcc att tta aaa aca aat ggt act aaa act aaa 52	8
ggt gct gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca 57 ggt gct gaa gaa ctt gga aaa tta ttt gaa tca gta gag gtc ttg tca 57 Gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Ser 185	'6
aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag ctt aca agc 6:  Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser  200 205	24
cct gtt gtg gca gaa agt cca aaa aaa cct tcc atg gta aat ddo oo.  Pro Val Val Ala Glu Ser Pro Lys Lys Pro Ser Met Val Asn Asn Ser  215	72
210	20
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gtt gtt ctg gct gtg aaa gaa att gaa act ttg ctt gca tct ata gat gtt gtt ctg gct gtg aaa gaa att gaa act ttg ctt gca tct ata gat Val Val Leu Ala Val Lys Glu Ile Glu Thr Leu Leu Ala Ser Ile Asp	816
gaa ctt gct act aaa gct att ggt aaa aaa ata caa caa aat ggt ggt Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys Ile Gln Gln Asn Gly Gly	864
tta gct gtc gaa gcg ggg cat aat gga aca ttg tta gca ggt gct tat teu Ala Val Glu Ala Gly His Asn Gly Thr Leu Leu Ala Gly Ala Tyr Leu Ala Val Glu Ala Gly His Asn Gly Thr Leu Leu Ala Gly Ala Tyr 295	912

41, t

aca ata tca aaa cta ata aca caa aaa tta gat gga ttg daa dat boar Thr Ile Ser Lys Leu Ile Thr Gln Lys Leu Asp Gly Leu Lys Asn Ser 310	960
gaa aaa tta aag gaa aaa att gaa aat gct aag aaa tgt tct gaa gat Glu Lys Leu Lys Glu Lys Ile Glu Asn Ala Lys Lys Cys Ser Glu Asp 335 325	1008
ttt act aaa aaa cta gaa gga gaa cat gcg caa ctt gga att gaa aat Phe Thr Lys Lys Leu Glu Gly Glu His Ala Gln Leu Gly Ile Glu Asn 345	1056
gtt act gat gag aat gca aaa aaa gct att tta ata aca gat gca gct  gtt act gat gag aat gca aaa aaa gct att tta ata aca gat gca gct  Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala  Val Thr Asp Glu Asn Ala Lys Ala Ile Leu Ile Thr Asp Ala Ala	1104
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aac ttg gca aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag aac ttg gca aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag aac ttg gca aaa gca gct aaa gag atg ctt gct aat tca gtt aaa gag aac ttg gca aaa gca gct aaa gag aac ttg gca aaa gca gct aaa gag aac ttg gca aat tca gtt aaa gag aac ttg gca aat tca gca gca gca gca gca gca gca gca gca g	1200
385	1205
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20 Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser vai hys Gly	
Asp Gly Ash The 40 35 Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Val Leu 55 60 Asn Leu The Asp Glu Ile	
Asn Leu IIII Gra 255 55 50 Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp Glu Ile 80 70 70 75 76 77 78 78 78 78 78 79 79 79 70 70 70 70 70 70 70 70 70 70 70 70 70	
Leu Ala Vai Lys Giu Vai 75  70  65  Ala Ala Lys Ala Ile Gly Lys Lys Ile His Gln Asn Asn Gly Leu Asp 90  85  85  86  87  88  88  88  88  88  88  88  88	)
Ala Ala Lys Ala Ile Giy Lys Lys 190 85 90 85 100 Ala Gly Ala Tyr Ala Ile	•
Thr Glu Tyr Asn His Asn Gly Ser Leu Leu Ala Gly Ala Tyr Ala Ile	1
Ser Thr Leu Ile Lys Gln Lys Leu Asp Gly Leu Lys Asn Glu Gly Leu  125 120 120 125	n
The Asp Ala Ala Lys Lys Cys Ser Glu IIII File IIII	
130 Lyc Glu Lys His Thr Asp Leu Gly Lys Glu Gly var 116	Ō
Lys Leu Lys Glu 27 150 155  145  Ala Asp Ala Lys Glu Ala Ile Leu Lys Thr Asn Gly Thr Lys Thr Ly  175  170  170  181 Yel Se	5
Ala Asp Ala Lys Gld 170  165  Gly Ala Glu Glu Leu Gly Lys Leu Phe Glu Ser Val Glu Val Leu Se	r
Gly Ala Glu Giu Leu Giy 275 252	-

Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu Leu Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro Ser Met Val Asn Asn Ser Gly Lys Asp Gly Asn Thr Ser Ala Asn Ser Ala Asp Glu Ser Val Lys Gly Pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Glu Ser Asn Ala Val Val Leu Ala Val Lys Glu Ile Glu Thr Leu Leu Ala Ser Ile Asp Glu Leu Ala Thr Lys Ala Ile Gly Lys Lys Ile Gln Gln Asn Gly Gly 280 Leu Ala Val Glu Ala Gly His Asn Gly Thr Leu Leu Ala Gly Ala Tyr Thr Ile Ser Lys Leu Ile Thr Gln Lys Leu Asp Gly Leu Lys Asn Ser 315 Cys Ser Glu Asp Glu Lys Leu Lys Glu Lys Ile Glu Asn Ala Lys Lys Cys Ser Glu Asp 335 phe Thr Lys Lys Leu Glu Gly Glu His Ala Gln Leu Gly Ile Glu Asn Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala

Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala

Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala

Val Thr Asp Glu Asn Ala Lys Lys Ala Ile Leu Ile Thr Asp Ala Ala Lys Asp Lys Gly Ala Ala Glu Leu Glu Lys Leu Phe Lys Ala Val Glu

Lys Asp Lys Gly Ala Ala 375 Asn Leu Ala Lys Ala Ala Lys Glu Met Leu Ala Asn Ser Val Lys Glu
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300 385 Leu <210> 83 <211> 1236 <212> DNA <213> ospC Chimera atg aga tta tta ata gga ttt gct tta gcg tta gct tta ata gga tgt

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Met arg Ieu Ieu Tle Gly Dhe ala Ieu <220> <221> CDS <222> (1) ... (1236) acy aga the dia and gga the got the got the got the and gga the got the got the got the act gga the got the got the act gga the got the go gca caa aaa ggt gct gag tca att gga tcc tgt agt aat tca ggg aaa gca caa aaa ggt gct gag tca att gga tcc tgt agt aat tca ggg aaa gca caa aaa ggt gct gag tca att gga tcc tgt agt aat tca ggg aaa gca caa aaa ggt gct gag toa att gga too tgt agt aat toa ggg aaa Ala Gln Lys Gly Ala Glu Ser Ile Gly Ser Cys Ser Asn Ser Gly Lys ggt ggg gat tot gca tot act act cot gct gac gag tot gcg aaa ggg
ggt ggg gat tot gca tot act act cot gct gac gag tot gcg aaa ggg
ggt ggg gat tot gca tot act act cot gct gac gag tot gcg aaa ggg 144 ggr ggg gac cot gcd act act cot gct gac gag tot gcg aca ggg tot gcg aca gcg ac cct aat ctt aca gaa ata agc aaa aaa att aca gat tct aat gca ttt 192 COL dat CLL aca yad ala aye add add all aca yat tot dat yed the pro Asn Leu Thr Glu Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala Phe 50

J9 3
100/102 gat gaa 240
ata gat gad
art tta tcl Tle Asp Glu
gag act try you be Ser I se 80
and gas get gly Thr Leu var
att get gtt aaa gau Val Glu Thi 25 75
gta ctt gct gtt aaa gaa gtt gag act ttg gtt tta tct ata gat gaa 240  gta ctt gct gtt aaa gaa gtt gag act ttg gtt tta tct ata gat gaa 80  Yal Leu Ala Val Lys Glu Val Glu Thr Leu Val Leu Ser Ile Asp Glu 80  65  Ctt gct aag aaa gct att ggt caa aaa ata gac aat aat agt tta 95  Ctt gct aag aaa gct att ggt caa aaa ata gac aat aat agt Leu Ala Lys Lys Ala Ile Gly Gln Lys Ile Asp Asn Asn Asn 95  Leu Ala Lys Lys Ala Ile Gly Gln Lys Ita gca gga gcc tat gca 336  15 Gga tcg ttg tta gca gga gcc tat gca 336
Val Leu Asn Giy
65 at the ggt caa add the Asp Ash Ash 95
aaa gct alt Gly Gln Lys 10 gg 336
ctt gct ady Lys Ala lie day
Leu Ala Lys Br 85 tra qca gga ala Tyr Ala
t gga tcg ttg Lau Ala Gly Ala
and all 99 for Leu lieu 110
act tta aat aat Cag Asn Gly Sel 205
gct Ala Leu Ash Ash
Ala Ala 100 ttg agt aaa tou Lys Asn Leu
aca gaa ada say ser bys 125
acc cta ata mbr Glu Lys Leu 32
gct gct tta aat aat tag Asn Gly Sel 200 Asn Asn Gln Asn Gly Sel 200 Asla Leu Asn Asn Gln Asn Gly 105  Ala Ala Leu Asn Asn Gln Asn Gly 105  ata tca acc cta ata aca gaa aaa ttg agt aaa ttg aaa aat tta gaa aa aat tta gaa aat
ata tca acc cta ata aca gaa aaa ttg agt aaa ttg aga aat tta gdu  ata tca acc cta ata aca gaa aaa ttg agt aaa ttg aga aat tta gdu  100  ata tca acc cta ata aca gaa aaa ttg agt aaa ttg aga aat tta gdu  125  120  120  110  120  120  120  120
aaq gct aay Cys Sei Gl
and aca gaa att gca aus Ala Lys By 140
tta aag ala Glu Ile Ala 17-
ata tca acc cta ata acc glu Lys heu so 120  11e Ser Thr Leu Ile Thr Glu Lys heu so 120  11f
GIU 130 to gca gat ctt ggy Lys Gln Asp 160
agt agt cas als Asp Lea -
t and cta and car Gly His Ala 1155
A y act aat ty Leu Lys ber
Thr Asn Lys Leu Lys 150 150 aca aca cat gca acc Thr Thr
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145  145  145  175  175  176  177  178  179  170
-t dat car sa type Ala
The ASP ASP HIS 165
gat tta tto Glu Ser Val
and the add I me the 190
gat and all phe Lys Apr
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acc gat gat cat gca add Ala Ala 116 170  Thr Asp Asp His Ala Lys Ala Ala 116 170  Thr Asp Asp His Ala Lys Ala Ala 116 170  Thr Asp Asp His Ala Lys Ala Ala 116 170  gat aaa ggt gct aaa gaa ttt aaa gat tta ttt gaa tca gta gaa ggt  190  gat aaa ggt gct aaa gaa ttt aaa gat tta ttt gaa tca gta gaa ggt  190  gat aaa ggt gct aaa gaa ttt aaa gat tta ttt gaa tca gta gaa ctt  Asp Lys Gly Ala Lys Glu Phe Lys Asp Leu Phe Glu Ser Val Lys Glu Leu  180  180
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ASP 180 rate gca cta act act act yal Lys or the Asp Ser Val Lys or t
ASP 1 180  ASP 2 180
ASP 1 180  ASP 2 180
ASP 1 180  ASP 2 180
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ttg tta aaa gca gct caa gta gca cta act aac Ser Val Lys Oston Ser
ttg tta aaa gca gct caa gta gca cta act aac y val Lys of the Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Of Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Of Leu Lys Ala Ala Gln Val Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn val Val Val Ala Glu Ser Pro Lys Lys Pro Asp Pro Asp Glu Ser Ala Lys 240
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ttg tta aaa gca gct caa gta gca cta act aac 205  ttg tta aaa gca gct caa gta gca cta act aac 205  Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys 205  Leu Leu Lys Ala Ala Gln Val Ala Colu Ser Pro Lys Lys Pro His Met Ala Asn  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 220  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 2210  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro Asp Glu Ser Ala Lys 240  a ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 240  a ggt ggg gat tct gca tct act aat 235  TGB 235
ttg tta aaa gca gct caa gta gca cta act aac 205  ttg tta aaa gca gct caa gta gca cta act aac 205  Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys 205  Leu Leu Lys Ala Ala Gln Val Ala Colu Ser Pro Lys Lys Pro His Met Ala Asn  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 220  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 2210  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro Asp Glu Ser Ala Lys 240  a ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 240  a ggt ggg gat tct gca tct act aat 235  TGB 235
ttg tta aaa gca gct caa gta gca cta act aac 205  ttg tta aaa gca gct caa gta gca cta act aac 205  Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys 205  Leu Leu Lys Ala Ala Gln Val Ala Colu Ser Pro Lys Lys Pro His Met Ala Asn  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 220  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 2210  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro Asp Glu Ser Ala Lys 240  a ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 240  a ggt ggg gat tct gca tct act aat 235  TGB 235
ttg tta aaa gca gct caa gta gca cta act aact a
ttg tta aaa gca gct caa gta gca cta act aact a
ttg tta aaa gca gct caa gta gca cta act aact a
ttg tta aaa gca gct caa gta gca cta act aact a
ttg tta aaa gca gct caa gta gca cta act aact a
ttg tta aaa gca gct caa gta gca cta act dat Ser Val Lys on Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys On Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys On Leu Lys Lys Ala Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 240  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala 240  225  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat gca 230  225  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct Asn Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat Ser Asn Ala 255  gga cct gtg gad gat ser Lys Lys Ile Thr Asp Ser Asn Ala 255  gga cct aat ctt acc gta gad ggad ggad ggad ggad ggad ggad g
ttg tta aaa gca gct caa gta gca cta act dat Ser Val Lys on Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys On Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys On Leu Lys Lys Ala Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 240  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala 240  225  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat gca 230  225  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct Asn Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat Ser Asn Ala 255  gga cct gtg gad gat ser Lys Lys Ile Thr Asp Ser Asn Ala 255  gga cct aat ctt acc gta gad ggad ggad ggad ggad ggad ggad g
ttg tta aaa gca gct caa gta gca cta act dat Ser Val Lys on Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys On Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys On Leu Lys Lys Ala Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 240  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala 240  225  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat gca 230  225  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct Asn Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat Ser Asn Ala 255  gga cct gtg gad gat ser Lys Lys Ile Thr Asp Ser Asn Ala 255  gga cct aat ctt acc gta gad ggad ggad ggad ggad ggad ggad g
ttg tta aaa gca gct caa gta gca cta act act act act act act act act a
ttg tta aaa gca gct caa gta gca cta act act act 205 Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Cos  195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct Ala Lys 235  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys 235  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct at act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat ctt cat ata gat 245  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca tct ata gat 270  285  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca Ser Ile Asp 270  265  270  270  271  272  273  274  275  276  277  277  278  278  279  270  270  270  270  271  270  271  272  273  274  275  276  277  277  278  279  270  270  270  270  270  271  271  272  273  274  275  275  276  277  277  278  278  279  270  270  270  270  270  270  270
ttg tta aaa gca gct caa gta gca cta act act act 205 Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Cos  195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct Ala Lys 235  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys 235  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct at act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat ctt cat ata gat 245  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca tct ata gat 270  285  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca Ser Ile Asp 270  265  270  270  271  272  273  274  275  276  277  277  278  278  279  270  270  270  270  271  270  271  272  273  274  275  276  277  277  278  279  270  270  270  270  270  271  271  272  273  274  275  275  276  277  277  278  278  279  270  270  270  270  270  270  270
ttg tta aaa gca gct caa gta gca cta act act act 205 Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Cos  195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct Ala Lys 235  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys 235  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct at act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat ctt cat ata gat 245  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca tct ata gat 270  285  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca Ser Ile Asp 270  265  270  270  271  272  273  274  275  276  277  277  278  278  279  270  270  270  270  271  270  271  272  273  274  275  276  277  277  278  279  270  270  270  270  270  271  271  272  273  274  275  275  276  277  277  278  278  279  270  270  270  270  270  270  270
ttg tta aaa gca gct caa gta gca cta act act act 205 Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Cos  195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct Ala Lys 235  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys 235  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct at act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat ctt cat ata gat 245  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca tct ata gat 270  285  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca Ser Ile Asp 270  265  270  270  271  272  273  274  275  276  277  277  278  278  279  270  270  270  270  271  270  271  272  273  274  275  276  277  277  278  279  270  270  270  270  270  271  271  272  273  274  275  275  276  277  277  278  278  279  270  270  270  270  270  270  270
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ttg tta aaa gca gct caa gta gca cta act act act 205 Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Cos  195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct cat atg gct aat 195  aca agt cct gtt gta gca gaa agt cca aaa aaa cct Ala Asn 200  Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct gca aaa 210  aat tca ggt ggg gat tct gca tct act aat cct gat gag tct Ala Lys 235  Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys 235  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct aat act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat tct at act Asp Ala 255  gga cct aat ctt acc gta ata agc aaa aaa att aca gat ctt cat ata gat 245  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca tct ata gat 270  285  ttt tta ctg gct gtg aaa gaa gtt gag gct ttg Ctt tca Ser Ile Asp 270  265  270  270  271  272  273  274  275  276  277  277  278  278  279  270  270  270  270  271  270  271  272  273  274  275  276  277  277  278  279  270  270  270  270  270  271  271  272  273  274  275  275  276  277  277  278  278  279  270  270  270  270  270  270  270
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ttg tta aaa gca gct caa gta gca cta act act act act act act act act a

ata tca aaa cta ata aca caa aaa tta agt gta ttg aat tca gaa gaa 960  Ile Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu Asn Ser Glu Glu 310	
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act aag cta aaa gat agt cat gca gag ctt ggt ata caa agc gtt cag 1056 Thr Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln 345	5
gat gat aat gca aaa aaa gct att tta aaa aca cat gga act aaa gac 110.  Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp  360  365	4
aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115 aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115 aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115 aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115 aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115 aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115 aag ggt gct aaa gaa ctt gaa gag tta ttt aaa tca cta gaa agc ttg 115	2
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390  aat cct gtt gtg gca gaa agt cca aaa aaa cct taa  aat cct gtt gtg gca gaa agt cca aaa aaa cct taa  Asn Pro Val Val Ala Glu Ser Pro Lys Lys Pro *  410  <210> 84 <211> 411 <212> PRT <213> ospC Chimera	36
Adolo	

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Asp Lys Gly Ala Lys Glu Phe Lys Asp Leu Phe Glu Ser Val Glu Gly 185 Leu Leu Lys Ala Ala Gln Val Ala Leu Thr Asn Ser Val Lys Glu Leu 200 Thr Ser Pro Val Val Ala Glu Ser Pro Lys Lys Pro His Met Ala Asn Asn Ser Gly Gly Asp Ser Ala Ser Thr Asn Pro Asp Glu Ser Ala Lys 215 235 Gly Pro Asn Leu Thr Val Ile Ser Lys Lys Ile Thr Asp Ser Asn Ala 250 Phe Leu Leu Ala Val Lys Glu Val Glu Ala Leu Leu Ser Ser Ile Asp 265 Glu Leu Ser Lys Ala Ile Gly Lys Lys Ile Lys Asn Asp Gly Thr Leu 280 Asp Asn Glu Ala Asn Arg Asn Glu Ser Leu Ile Ala Gly Ala Tyr Glu Ile Ser Lys Leu Ile Thr Gln Lys Leu Ser Val Leu Asn Ser Glu Glu 295 315 Leu Lys Lys Lys Ile Lys Glu Ala Lys Asp Cys Ser Gln Lys Phe Thr 310 330 Thr Lys Leu Lys Asp Ser His Ala Glu Leu Gly Ile Gln Ser Val Gln 345 Asp Asp Asn Ala Lys Lys Ala Ile Leu Lys Thr His Gly Thr Lys Asp 360 Lys Gly Ala Lys Glu Leu Glu Glu Leu Phe Lys Ser Leu Glu Ser Leu 375 Ser Lys Ala Ala Gln Ala Ala Leu Thr Asn Ser Val Lys Glu Leu Thr 390 Asn Pro Val Val Ala Glu Ser Pro Lys Lys Pro 405

Chory.